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Contributions to Central Charges

ONE of the matters to be discussed before the Transport Tribunal during the hearing of the Passenger Charges Scheme, 1953, is the contribution to be made by the various services to the central charges of the British Transport Commission. Justifications for a flexible policy in respect of allocations to meet these obligations of the Commission, largely consisting of interest and redemption obligations in respect of capital borrowings, were put forward in the B.T.C. report for 1951, where it was maintained that to allocate the central interest costs today on a permanent basis would prejudice future development. Broad justice could still be aimed at, it was asserted, without these rigid apportionments. While charging policy remains the responsibility of the B.T.C., however, it is inevitable that there will be differences of view between its constituent undertakings of what constitutes broad justice in apportioning their shares and wisdom in laying down how they are to earn them. The pre-war pooling between the main-line railways themselves and with London Transport, quoted in the report as proof that there is nothing "revolutionary" in the present "partnership," is not a parallel with the existing situation because the parties concerned in this arrangement were responsible for their own charging policy. In 1951 British Railways improved their net traffic receipts by

£8.1 million, while London Transport receded by £3.2 million on its road services and by £0.1 million for rail activities, the combined result being a net deficit of £1.5 million. A deficit of £3 million has been forecast for 1953. The danger of the present position is that in seeking compensation elsewhere changes might be sought in main-line fares to the detriment of traffic development.

Machine Tool Productivity

THE British productivity team which visited the United States recently to study the machine tool industry there, has now published its report. In its recommendations great emphasis is laid on the need for simplification and standardisation, not only on an individual plant, but on an industry-wide basis. It points out that the American machine tool industry appears to have a slightly higher relative productivity, overall, than the British industry, but the best of British machine tool plants are at least the equal of any of the American plants visited. American and British machine tools, it is pointed out, are in general too expensive, a feature which greatly limits sales, and it is recommended that the industries in both countries should take steps to improve productivity by rationalisation, which would, no doubt, involve major changes in the structure of the industries, and in relationship between the firms comprising them. The report points out that many British and some American firms spend too many man-hours on appearance finish, and more emphasis should be placed on the capability of the machine tool, many parts of which, it is considered, are needlessly accurate. While less attention to finish would undoubtedly reduce the cost of individual machines, it is a moot point as to whether indifferent finish would be of advantage to the machine tool industry, which has been built-up as a result of its reputation for accuracy and good workmanship, and since the report appeared the Institute of Metal Finishing has emphasised the importance of this factor.

Locomotive Exports in 1952

THE growing importance of diesel and electric traction in overseas markets for British locomotive builders can be deduced from the export figures for the three years 1950-51-52 given in the *Trade & Navigation Accounts* for last December. Unfortunately the classification "rail locomotives" includes industrial besides main-line railways; the division of the totals into "steam" and "other locomotives" is insufficiently informative in these days of diesel, electric, and gas-turbine traction developments, whilst the entries under countries and geographical regions do not even show the number of steam locomotives individually; and the lumping together of several important markets as "other Commonwealth" and "other foreign" countries goes far to defeat the object of the returns. The total value of British locomotive exports rose from £9.4 million for 1950 to £12.4 million last year, and of that the value of the non-steam ("other locomotives") element increased from £1.9 to £4.3 million, with a rise of only half-a-million in the total value of steam locomotives. The inclusion of industrial locomotives precludes comparisons between the total tonnages and numbers of units exported. In value the steepest rise was for "other Commonwealth" countries, from £274,000 for 1950 to £824,000 for 1951 and £1.6 million for 1952, whilst the total value of exports to "other foreign" railways increased from £1.4 million for 1950 to £3.2 million last year.

Area Holiday Guides

THIS year's edition of the five British Railways area holiday guides includes the usual comprehensive information on holiday resorts, hotels, boarding houses, and lodgings, with a selection of photographic illustrations well up to the high standard of these guides. With so much to be had for one shilling, it is a pity that the few blemishes have not been removed. Some county maps perhaps might give more prominence to branches such as the Sidmouth branch of the Southern Region, which is shown in a map

of Devon as a thin line, though surely as important for holiday traffic as the Western Region Taunton to Barnstaple branch, shown thick. The growing importance of holiday traffic from the well-paid industrial North and Midlands to the South-West seems to justify more particulars as to fares. In view of the existing Regional boundaries of British Railways and of holiday traffic flows which tend to conform more to the territorial limits of the main-line companies before nationalisation and even before Grouping in 1923, the present division into areas served by the five guides seems inevitable. The intending holidaymaker can hardly do better than consult, as advised, the Commercial Superintendent of the Region controlling the station where his journey begins.

Inspiration for Station Design

IT is strange in the light of a recent comment that railway stations are often the "drabdest, dirtiest, and ugliest places in the towns they serve," to read in Ruskin's "Seven Lamps of Architecture" that "another of the strange and evil tendencies of the present day is the decoration of the railroad station." Ruskin, whose observations on this matter have been recalled to us by a correspondent, considered that the only charity the designer of a station could extend to the traveller was to show him how soonest to escape from it, and this was his opinion before the dust of years had had time to settle on the decorative features he deplored. Some of the present criticism of railway stations hinges on architectural details that are considered uncouth by current standards. Where new stations have been built, they have been designed in accordance with later trends of taste, a process that must continue, though not necessarily leading to what Mr. John Betjeman has criticised as "packing case architecture." His advice to architects designing for British surroundings is "to look at the finer Victorian and late Georgian warehouses of London, Liverpool, and Hull, the card mills of the North, the graceful factory chimneys of a century ago."

Further Electrification in France

SOME 6,200 miles of main line will be electrified in France in the next ten years and on branch lines diesel traction will replace steam. Monsieur Louis Armand, Director-General of the French National Railways, in making this pronouncement to the Société des Ingénieurs Civils de France, said that electrification of the Valenciennes-Thionville line had begun and would be followed by that of the Paris-Strasbourg line. Electric operation of the Paris-Lyons line was resulting in a profit of 10 per cent. M. Armand stressed the advantages of direct use of industrial single-phase current at 50 cycles, 25,000 V., which permitted an economy of 45 per cent in the line equipment. Russia, he said, was preparing to equip 11,600 miles on the 50-cycle system. On the experimental line from Aix-les-Bains to La Roche-sur-Foron the Co-Co electric locomotive had already run 217,000 miles without a hitch. According to *La Vie du Rail*, the first electric trains will be running on the Valenciennes-Thionville line in 1954, and electrification will be completed between these towns in 1956. It will then be extended to the region of the coal and iron mines of Lorraine and later of Lille.

Diesels and Snow

RAILWAYS in the northern United States are beginning to discover a new value in their diesel locomotives when operating during the winter in extremely low temperature conditions. It is found that the diesel units, with their rounded nose ends and curved steel fenders extending down almost to rail level, are capable of acting quite efficiently as their own snowploughs, so rendering unnecessary the use of independent ploughs after heavy snowfall. Among minor lines, the Spokane International, with 151 miles of line extending northwards from the city of Spokane, Washington, to the Canadian frontier at Yahk, may be taken as an example. In the first winter after the introduction of 1,000 h.p. diesel road-shunters, which

was so severe that the temperature fell to 45 deg. of frost, the company found that two of these units, with multiple-unit control, could work their trains through an average depth of 3 ft. of snow along the entire length of the line, and through drifts as deep as 10 ft., without requiring assistance. Speed fell to 12 m.p.h. through the drifts, but the high tractive effort and smooth torque of the diesel power plants enabled the locomotives to keep moving steadily with their trains. These are among the economies which have enabled the Spokane International already to show a 17 per cent return on the capital invested in its diesels; with complete dieselisation this is expected to rise to 23 per cent annually.

Misreading a Home Signal

THE derailment at Shawford on July 20, 1952, at the outlet sand-dragged trap to a terminating local line, was an example of what has occurred on several occasions where there are parallel lines and a signal has been cleared for another train, namely seeing one's own distant signal to be at "caution" and then misreading the indication of the home signals. Brigadier C. A. Langley's report on the mishap is summarised on another page. The two up lines were adjacent and their signals mounted on bracket posts outside the left-hand line, as was general practice on the former L.S.W.R., and seen elsewhere where the tracks are so arranged. The driver frankly admitted his mistake, which A.T.C. at the distant signal could not have prevented, for he acknowledged that he knew that signal to have been against him. Brigadier Langley thinks he was not keeping a very good lookout, and catching sight, amidst smoke, of an arm in the "off" position hastily assumed it to refer to his train. Fortunately, although the engine overturned down the embankment, nobody was hurt.

Signals for Parallel Lines

AS soon as additional tracks came to be laid along our original double lines, the difficulty arose of how best to arrange the signals, since for some time it was not the custom when quadrupling to leave sufficient space to erect posts between tracks. The difficulty was less serious when both up or down tracks were adjacent, but where the alternate arrangement was adopted it led to the signals for one line being separated from it by two others. In France, except in the case of block semaphores, to which special rules could be made to apply, a very strict attitude was taken in this matter and bracket structures, invariably bringing the signals either immediately to the left, or over the left-hand rail, of each track were insisted on, as any other arrangement, with the revolving target type signal, would be very confusing. This accounts for the large number of *potences* seen on the French lines, sometimes reaching out over two or three tracks and carrying but a single signal. Of late years it has been the practice here, when renewing signals or changing to colour-lights, to make longer brackets, and so lessen the liability to misreading.

Standard Gauge Locomotives for Iran

AMONG the locomotives recently built by the Vulcan Foundry Limited are 64 for the Iranian State Railways. The engines have a tractive effort of 49,200 lb. at 85 per cent boiler pressure, and are capable of dealing with trains of 592 tons on a grade of 1.5 per cent, or 296 tons on a grade of 2.8 per cent, with curves of 772 ft. radius, for which purpose a thin flange is provided on the driving wheels, and the distance between the intermediate and driving wheel tyres is $\frac{1}{4}$ in. less than the leading and trailing. The rolled steel bar frames extend the full length of the engine bed and are finished to a thickness of 4.33 in. The boiler is supported at the front end by the smokebox saddle; each half is cast integral with the cylinder. Three expansion brackets are provided below the boiler barrel, and one at the firebox back. The coupled wheel centres are of SCOA-P type, and the axleboxes are of cast-steel, with gunmetal bushes lined with white metal; the axlebox

keeps are fitted with Armstrong oilers. British Timken roller bearings are fitted to the leading truck, radial arm trailing truck, and the two four-wheel tender bogies, which are of diamond frame pattern. The locomotives are described elsewhere in this issue.

November Operating Results

THE four-week period from November 2 to the end of the month was a lean one for British Railways. The table below summarises the principal freight traffic figures in No. 12 of *Transport Statistics* and emphasises the sharp decline in traffic volume from the 1951 level.

Statistic for British Railways	Four weeks to November 30	Decrease from 1951	Decrease per cent
Tons originated ... (000s)	23,159	186	0.8
Net ton-miles ... (000s)	1,799,647	95,312	5.0
Wagons forwarded ... (000s)	2,818	77	2.7
Wagon miles, loaded ... (000s)	253,704	16,690	6.2
" " empty ... (000s)	101,715	1,300	1.3
Freight train miles ... (000s)	11,224	319	2.8
" " hours ... (000s)	1,340	62	4.5
" " load ... (tons)	160	4	2.3
Net ton miles per train hour ...	1,108	7	0.6
Wagon miles per train hour ...	219	1	0.3

Against this list of decreases in ten fundamental statistics, all there is to set is a lift of nearly quarter-of-a-ton in the average wagon load at starting point to 8.75 tons and a slight improvement in freight train speed to 8.38 m.p.h. As was to be expected through the lower density of traffic, all Regions moved trains a little faster, except the North Eastern, but it still set the pace, in company with the Scottish Region, at 10.11 m.p.h.

Once again there was a regrettable fall in merchandise forwardings of 350,000 tons (8.1 per cent), spread over the six Regions. A partial offset to this decrease was a record output of 5,267,000 tons of minerals, representing an increase of 176,000 tons (3.4 per cent). The Eastern Region took the lead by originating 110,000 more tons of minerals (11 per cent) and also carried 105,000 more tons of coal and coke (4.7 per cent). The Eastern total traffic of 4,040,000 tons was 4.6 per cent above November, 1951. The London Midland Region was able to raise its total forwardings by 1.4 per cent, because it carried 184,000 more tons of coal (5.1 per cent), while the Western Region coal tonnage decreased by 187,000 tons (7.8 per cent). Altogether the Western Region lost 248,000 tons of traffic in all classes (6.1 per cent). The Scottish Region also fared badly, losing 70,000 tons of merchandise (11.1 per cent) as well as 73,000 tons of coal (4.5 per cent).

Despite a drop of 71,000 tons in merchandise (10.8 per cent) the entire North Eastern traffic kept steady in contrast to the wide fluctuations in the Western and Scottish Regions and to a decrease of 8.2 per cent in the scanty Southern Region traffic, reducing its amount to 668,000 tons.

THE LOCOMOTIVE POSITION

During each of the seven periods from May 18 to November 30 British Railways produced fewer ton-miles than in 1951, the total decrease for the 28 weeks amounting to 582 million (4.7 per cent). During these weeks freight train miles were reduced by 1,765,000 (2.3 per cent) and the number of spare locomotives rose from 242 on August 10 to 423 on November 30. Between these dates the net operating stock (in other words, the stock owned less locomotives hired and stored) decreased by 255 from 18,924 to 18,669 and the number of locomotives available for traffic dropped by 393 from 15,841 to 15,448, the percentage of net stock under repair having risen from 15.8 in July to over 17 from September onwards. If the volume of traffic had remained at the 1951 level, it might not have been easy to cope with it efficiently. A brief summary of the locomotive position as it has altered since nationalisation may, therefore, not be out of place.

The first report of the British Transport Commission stated that British Railways owned 20,101 locomotives at

the date of vesting and explained how ownership changed to 20,302 at the end of 1948. Subsequent developments can be followed readily from the summary below.

LOCOMOTIVE STOCK, 1948 to 1952

At end of year	Owned	Hired	Stored	Net operating stock
1948	20,302	48	497	19,757
1949	19,914	39	489	19,386
1950	19,741	62	626	19,053
1951	19,249	40	400	18,849
1952 (to November 30) ...	19,092	—	423	18,669

At November 30, British Railways owned 1,210 fewer locomotives than at the end of 1948. Concurrently net operating stock was reduced by 1,088. A list of numbers may not, however, be a reliable measure of the relative efficiency of motive power from year to year. During the 48 weeks to November 30 last, 407 engines were scrapped and only 250 new machines were added to stock. The loss of 157 engines may be little more than nominal if the new stock turns out more work than the locomotives displaced.

ELECTRIFIED FREIGHT LINES

Traffic on the Manchester-Sheffield-Wath electrified lines was more brisk in November than in any period since May. Freight train miles numbered 24,483, an increase of 1,587 on October. The loaded wagon mileage of 653,000 was exceeded only by the March return of 700,000, but the output of 115 wagon miles per train engine hour compared badly with the March figure of 133. The freight train speed of 6.7 m.p.h. was the slowest for any period, though 15,925 "assisting engine miles required" were worked.

Of the 51 electric locomotives provided, none was in store but six were under repair on November 30. Altogether it is disappointing that better progress cannot be reported after nine months of experimental working on this electrified system.

RAILWAY PASSENGER TRAFFIC

October was a disastrous month for railway passenger traffic. The number of journeys originated was 77,718,000, a decrease of 4,883,000 (5.9 per cent). The astonishing thing about this set-back was the loss of 2,925,000 journeys in the Southern Region (8.9 per cent). Until last year the Southern, with its network of electrified lines, was pre-eminent as a passenger carrier. Over the two years 1949 and 1950 its carryings rose by 7 million, while British Railways as a unified system lost more than 14 million passengers.

In 1951 the Southern Region had 13.5 more bookings, rather over two-thirds of the 19.6 additional bookings made in all Regions. During the first ten months of 1952 journeys originated on the Southern were down by 7,587,000, or 2.3 per cent, compared with a decrease for the whole system of 8,629,000, or about one per cent. This sharp change in the trend of the Southern traffic happened despite the running of 97,000 more steam coaching train miles and 447,000 more electric train miles in the first 41 weeks of last year.

In October, British Railways booked 153,000 fewer first class passengers, a decrease of 6.8 per cent. That was the least loss of first class travel in any month since March. The London Midland and the Scottish Regions recorded modest increases; and the North Eastern, which lost much of the higher class business until August, carried 23,000 more passengers in October, an increase of 27.2 per cent. The Southern, in contrast, originated 125,000 fewer journeys, a fall of 21.4 per cent. The Eastern Region also fared badly, losing 42,000 journeys (18.7 per cent) and the Western had a further decrease in journeys of 28,000 (11.3 per cent).

During the ten months to October last, the total number of first class journeys on British Railways was 17,912,000, a decrease of 2,812,000 from 1951, or 13.5 per cent. In the year 1937 first class travel constituted

about 3·7 per cent of passenger journeys totalling over 1,295 million. In future our Railways are not likely to book at first class fares more than 2 per cent of a sadly diminished volume of rail travel.

ROAD TRANSPORT

British Road Services hauled 3,166,000 tons in November, 626,000 tons (16·5 per cent) below 1951 carryings. Vehicle miles were reduced by 8,188,000 (12·9 per cent). The tonnage handled during the first 48 weeks of 1952 was 38,876,000, a decrease of 4,645,000 tons from 1951 (10·6 per cent).

Road passenger transport expanded its services in November. The Tilling Group ran 247,000 more car miles, an increase of 0·9 per cent, but carried only 40,000 more passengers. The Scottish Group ran 328,000 more car miles, an increase of 2·6 per cent, in transporting 530,000 more people. Together the Groups carried 175,114,000 persons at an average fare of less than 4·5d.

Encouraging Holiday Travel

SO far the increased number of people taking holidays away from home has not been reflected in an improvement in railway passenger receipts attributable to holiday travel. An article by Messrs. L. Lickorish and A. G. Kershaw in the current issue of the *British Transport Review* notes a decline between 1949 and 1951 in holiday travellers by train as shown in the large-scale surveys of those two years made by the British Travel & Holidays Association. The numbers going by rail decreased from 53 per cent of the total in 1949 to 47 per cent in 1951. In 1949 the proportion of total holiday expenditure on rail travel was 11 per cent, and the authors have taken the figure of 9 per cent for 1951, which would give an income to the railways from this source of about £34 million out of the total railway receipts from ordinary fares in that year of £89·6 million.

The importance attached to holiday travel as a source of railway revenue is evident from the emphasis laid by Mr. David Blee on the fact that holiday fares would not go up when speaking at the conference on January 5 on the new passenger charges scheme. In their article in the *British Transport Review*, the authors point out that not only have these fares remained stable in the period considered, but the increased cost of other items in the holiday budget has made transport a relatively less expensive item. Yet the trend has been the wrong way, and the authors' contention that a large expansion in the holiday trade in present conditions is unlikely has been borne out by a survey of 1952 issued by the British Travel & Holidays Association. Here it was reported that the increase in holiday trade was small, involving probably only 1 per cent of the population. Meanwhile the cost of travelling by car continues to be attractive, particularly for a family of three or more. If the railways are to offer a counter-attraction, it is suggested that they should be able to give holidaymakers of limited means a wider choice of destinations than is possible with their present fare structure, under which the fares paid by holidaymakers bear little relation to the cost of providing the service, and might almost be held to subsidise the essential passenger movement which contributes less than the cost of services.

In their conclusion, therefore, the authors put forward a case for treating holiday travel as a separate commodity with a separate market, with its own charges aimed both at stimulating travel—particularly out of the season—and at directing it to certain areas. Most of the four million workers who received an additional week's holiday with pay seem to have added it to the most favoured holiday period—just before or just after the August bank holiday. The article quotes the penny post as an example of charging by mileage being completely abandoned. It maintains that the railways have it in their power by means of a special fares structure for holidaymakers to develop the enormous holiday market created by the redistribution of incomes and full employment.

Repairing Earthquake Damage in U.S.A.

THE Southern Pacific Railroad has two routes connecting San Francisco and Los Angeles, the coast route and the inland or San Joaquin Valley route. The Atchison, Topeka & Santa Fe Railway has running powers over the inland route. During the week which ended on July 19 last the daily average number of trains worked over the coast route was eight passenger, eight through freight, and a number of local freight. In the same period the traffic over the inland route averaged 12 Southern Pacific and nine Santa Fe through freight trains, or 21 in all, in addition to passenger and local freight trains.

On July 21 occurred the second most destructive earthquake experienced in California. The region affected was the Tehachapi Mountains, crossed by the inland route, 11 miles of which suffered serious damage, including four tunnels partly destroyed. As described in an article in this issue, emergency repairs, involving the moving of 1,250,000 cu. yd. of earthworks, were completed, with a fleet of heavy plant working night and day, in the remarkably short period of 25 days.

Meanwhile, traffic had to be diverted to the coast route, which thus had to handle a daily average of 24 through freight trains—three times the number before the earthquake—in addition to local freight and passenger services. Diesels were transferred from the inland to the coast route and others were borrowed from the Santa Fe system, and to work as assistants over the 1 in 45 ruling gradients on the coast route near Santa Margarita 2-10-2 and other locomotives were pressed into service. Elsewhere on this route the ruling gradient is 1 in 100. On the inland route the principal passenger services were maintained as far south as Bakersfield.

The inland route via San Joaquin Valley and over the Tehachapi Mountains was constructed in 1875-76. The Tehachapi summit has an altitude of 4,025 ft., and the climb from the foot of the mountains is 2,700 ft. in a distance, as the crow flies, of 16 miles. To secure a 1 in 45 ruling gradient, however, the distance by the line is 28 miles. In one section there is a complete spiral loop, the line climbing 77 ft. to cross over itself. There were originally tunnels with lengths up to 1,170 ft., but two were by-passed in 1921 and one was opened out in 1943. The line is single throughout and is worked by centralised traffic control. The rapid repair works, according to a message published by the President of the S.P.R.R., was made possible "by the greatest emergency concentration of earth-moving equipment ever assembled in the United States." Considering the size of the work involved the restoration was an outstanding feat.

Gas-Turbine Locomotives

THE steam locomotive until relatively recently dominated the railway field, except where electrification is used. Its advantages are that it is mechanically robust, relatively cheap, simple of operation and maintenance, and capable of burning a variety of fuels—oil, coal, or, if necessary, wood. In referring to the characteristics and the future of gas turbines during the delivery of his paper "Gas Turbine Locomotives" presented to the 5th Annual Conference of the Associazione Tecnica dell'Automobile, Florence, recently, Mr. James Hodge, Senior Consultant, Power Jets (Research & Development) Limited, said that so far all gas-turbine locomotives placed in service had electric transmission systems. This might be due to the ready availability of the electrical equipment and experience obtained with it in diesel-electric locomotives. It was not, however, an essential, as with an appropriate type of gas turbine, the torque characteristics were suitable for a mechanical drive to be used without any change speed gearing, except possibly for reversing.

Elimination of electrical equipment would reduce weight, bulk, and cost, very considerably, and make the gas-turbine locomotive a very attractive proposition. Hitherto most gas turbines had used oil fuel similar to those used in diesels, but with a wider range of choice. Heavy

residual oils had also been used which were considerably cheaper than distillates in most countries, and the development of coal-burning turbine locomotives was being pushed ahead in Great Britain, the United States, and Canada, where coal is the cheapest available fuel. In referring to possible future trends in design, Mr. Hodge said that gas turbines built or projected had a single compressor shaft, and there seemed little likelihood that any departure would occur. Compressors had been of the axial type, which at present was more efficient than the centrifugal, and whose smaller cross-section might, at first sight, be thought advantageous in a locomotive. It might be that the centrifugal would return to favour, at least as the high-pressure part of the compressor, because of its greater robustness, lower cost, and greater flexibility of operation, all of which were of the utmost importance in railway service.

Further, provided that the diameter of a centrifugal compressor could be incorporated within the space available, there was no great advantage in using a type having a smaller diameter. It might be that the shorter length of the centrifugal type would allow the power unit to be placed across the chassis or even vertically, in some respects a natural arrangement. All turbines used for locomotive work had been axial flow machines; this would probably continue, except perhaps in the smaller sizes, up to about 1,000 h.p. Radial inward flow turbines had advantages similar to centrifugal compressors, and in fairly small sizes might be attractive for railcars and similar applications. Combustion chambers were conventional except for coal burning types. Maximum cycle temperatures were in the range from 550° to 750° C. In some cases heat exchangers had been used, all of low thermal ratio, chiefly because of the bulk involved with the tubular form of construction. With such cycles, peak thermal efficiencies at the turbine output shaft lay between approximately 16 and 24 per cent, with temperate intake temperatures. There were, he considered, very marked possibilities for improvement on these figures, the best of which (combined with mechanical drive) could already provide serious competition for the diesel-electric type. The two most important lines of development for gas-turbine locomotives apart from those aimed at utilisation of cheaper fuels, were to increase maximum cycle temperatures, and to improve heat exchanger performance. With present-day materials it was possible to use quite high maximum temperatures, and very much higher temperatures may become possible in the next few years by means of various cooling techniques now being developed.

A Commercial Revolution

(From a Correspondent)

EVERY separate component of the B.T.C.'s undertaking seems to be expected to stand financially on its own feet. The general acceptance of this view in railway circles is remarkable; judged by transport history up to the war, it marks a revolution in railway thought. It has its origin, no doubt, in economic necessity but it is none the less odd that nationalisation should appear to the outsider less disposed than private enterprise to look at a public service as a whole.

In some respects the revolution appears to be getting out of hand. The argument is used that one component of the B.T.C. should not be expected to subsidise another. In another form it is the users of one component who should not be expected to subsidise the users of another. The use of the word "subsidise" in either context begs the question; subsidies are in such bad odour generally that to call anything a subsidy is to condemn it. In relation to transport users the offence against logic can perhaps be justified on other grounds; it is at least no misuse of words to say that one class of user subsidises another, and the aura of disrepute attached to the word may help to gain public acceptance of an increase in charges. This is not to admit that all subsidies are a necessary evil; it is simply

to make tactical use of their current unpopularity. As applied, however, to the relations between two parts of an undertaking the term "subsidy" is a complete misuse of words and should be struck out of the transport vocabulary.

All business undertakings find that some of their activities turn out to be financial failures, either from the start or after a period of success. They do not talk about subsidies; they decide whether to withdraw their unprofitable lines, or carry the loss for reasons of prestige or contributory value, or put their prices up. One gets the impression that the introduction by the B.T.C. of costing techniques into fields where they have been for generations considered impracticable has gone to the heads of some of those concerned. It has suddenly become possible to isolate a particular service and say whether it pays, and it seems to be an almost automatic reaction, if it does not pay, to raise the charges or discontinue the service altogether.

Railways in the past did not build branch lines and hotels or run restaurant car and cartage services as an outlet for surplus funds; they did these things with the double object of creating railway traffic and excluding competitors. Some of the competition now comes from a different direction and it is only natural that certain services, particularly the running of branch passenger trains, are found to have outlived their purpose; but the contributory value of others is still important. That they should individually pay their way is not necessarily the first consideration; the point is rather that they should help the B.T.C. as a whole to pay its way by encouraging patronage of the services to which they are ancillary. With the word "ancillary" we probably reach the crux of the problem. It is a word rarely heard these days. When a department is set up to run a section of a business it does not like to be called ancillary. The staff takes a natural pride in its department and tends to be reluctant to look across the artificial boundaries which separate its work from that of other departments. Will a more synoptic view emerge from the organisation contemplated in the Transport Bill? Whatever may happen between Executives or departments, an interesting situation is bound to arise within the railway commercial department.

Traffic costing, an essential prerequisite of integration, in which it would have provided the data for a combined road and rail charges scheme, has revolutionised railway commercial thinking. For generations "what the traffic will bear" has been regarded as the only proper, and in any case the only practicable basis of railway charges. Now, almost suddenly, an organisation exists to tell the commercial department what it costs to provide the services it sells. A revolutionary weapon has been placed in the hands of the rates experts, and what is more, the Government proposes to give them freedom to use it. The stage appears to be set for a headlong collision between those veteran theoretical antagonists, "what the traffic will bear" and "cost of service."

Until the preparation of a new charges scheme, anything that is done will have to be done within the framework of the existing rates system, which is based for the most part on "what the traffic will bear." Theoretically, "cost of service" would advance by way of revealing and either raising or cancelling exceptional rates not high enough to cover cost; at the same time, it would reveal rates giving a wide margin of profit over cost, by reducing which new traffic could be attracted to compensate for that lost by the raising of unremunerative rates. Even as a theory, this carries the implication, which might not be always borne out in practice, that the costs of the unremunerative services, as revealed by traffic costing, would be truly separable in the sense that they could be saved if the traffic to which they relate were lost. As a practical issue, the possibility bristles with difficulties, both commercial and administrative. It will be very surprising if traffic costing turns out to be anything more, for some time to come, than a device for supplying the rates experts with a "cost line," as some substitute for the comfort and support they have had for so long from the "40 per cent below standard" line. And it looks like being a long time before the issue between "what the traffic will bear" and "cost of service" is really worked out in practice.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Aluminium Alloy Coaches

January 22

SIR,—In Mr. T. W. Barrow's interesting article in your January 16 issue on the new lightweight coaches for the East African Railways he mentions the adoption of aluminium sheeting for the exterior covering of the Liverpool-Southport electric stock of the Lancashire & Yorkshire Railway.

Another early example was the aluminium exterior paneling of the South London line electric stock of the L.B.S.C.R. introduced in 1909. The writer remembers the surprise which this "unusual" construction caused when these vehicles were being converted from overhead to third-rail traction at Brighton about 1930. These vehicles are still at work in two-car sets on the South London line and are distinguishable by the section of flat roof at one end where the bow collectors were housed.

Yours faithfully,

P. S. PALMER

68, Victoria Street, London, S.W.1

into consideration. Restaurant car attendants should be trained to be "diplomats in their own sphere" and catering staff instructed in salesmanship and sales promotion. Simple dishes should be offered at a sensible price with quantity to sell as the main objective. In this respect quality must not be sacrificed. More consideration should be given to the passenger who wants a light refreshment on the journey rather than a main meal. There should be complete overhaul of the present administration and stricter attention paid to the costing of the job with a view to reducing present prices by 50 per cent.

To the Hotels Executive I throw out a challenge. Give me 12 months' trial to cater for you. I will guarantee satisfaction to the travelling public, excellent, economical, standard of catering, and a good profit. If I should fail, throw me out.

Yours faithfully,

RICHARD O. DAVIES

Royston House Commercial Hotel,
3, Chequer Road, Doncaster

Cost of Station Improvements

January 25

SIR,—An interesting comparison in railway building costs is revealed by details of the Bletchley modernisation scheme, described in your December 12 issue, which apparently cost less than the provision of a new enquiry and reservation bureau in the Great Hall at Euston. The old structure spoilt the Great Hall aesthetically but always appeared to function with ease and efficiency even at the busiest holiday times. The new refinements are very pleasing to the eye, but it is not difficult to think of many more Bletchleys in need of essential maintenance, let alone betterment. Even so, it is tempting to think that a more liberal use of soap and water could effect quite a difference.

Apparently it cost £2,800 to build and equip one refreshment room at Bletchley, which is more than the cost of building a complete house, and presumably the new facilities at Euston will be equally costly. It would be interesting to know why a snack bar was not incorporated in the new train arrival bureau at Euston, where people not infrequently have some considerable time to spare.

Yours faithfully,

B. C. L. DAVIES

21, Dornton Road, South Croydon

Reviving the Period Excursion

January 20

SIR,—The ordinary railway fares are clearly at a level that deters many from making long-distance holiday or pleasure journeys by train. Yet it is on long-distance services that the railways can show the greatest advantage in comparative costs. During the nineteen-twenties a similar drift away from the railways was met by the introduction of the period excursion, and the 'thirties produced the "bargain night-travel" return tickets.

Perhaps the period excursion would once again be the means of attracting back to rail that section of the public, travelling for reasons of pleasure or family, which now tends to go by motorcoach if it travels at all. To prevent the loss of regular traffic at the ordinary rates, the reduced fares would have to be available only by specified trains (specials where possible) and perhaps restricted to certain days, with a duration of a week or a fortnight. To gain the best economic advantage these facilities should be confined to long-distance traffic, say 100 miles and over.

The times and schedules of the trains provided could be arranged to minimise their usefulness to the business traveller prepared to pay the ordinary fare. High speeds would not be required. Trains, if specials, could be formed entirely of third class stock, with cafeteria or buffet refreshment facilities instead of the more elaborate restaurant cars. For overnight journeys the four-berth third class sleepers which are now outmoded on ordinary services might still be acceptable to excursion travellers.

In short, these proposals are merely the application to the railway sphere of the equivalent of the tourist air services, with the same object of tapping new fields of potential traffic.

Yours faithfully,

J. N. FAULKNER

53, Westfield Road, Surbiton

Hotels Executive Catering

January 9

SIR,—May I express my opinion on the quality of the catering of the Hotels Executive on long-distance trains and in refreshment rooms. I speak as a qualified caterer, who has had seven years of high-grade catering at lowest possible cost.

The present charge of 7s. 6d. for a lunch or dinner is not merely prohibitive or even excessive, but ridiculous. It has been stated that even by charging 7s. 6d. for a main meal the Hotels Executive is losing money. I cannot possibly conceive how this is so. Today, even with prices of food as high as they are, I can produce a three-course meal at 4s. 6d. which guarantees me a profit of 9d. per meal. During my trips on the main line I have observed that the Hotels Executive caters for a set number of meals—my guess is for one-eighth of the complement of the train. Whether the restaurant car is patronised to the extent envisaged is difficult to say, but much more difficult to believe. Nothing is done to encourage sales or salesmanship on the part of the restaurant car staffs.

I suggest to the Hotels Executive that if it would like to cater at a profit the following points should be taken

TWICKENHAM STATION RE-CONSTRUCTION.—Work is to recommence on the construction of the new passenger station at Twickenham, Southern Region. A start was made before the war, and by 1939 much of the work had been carried out on the two new island platforms. These now are to be completed by the provision of roofing and waiting room accommodation, with access from a covered footbridge leading from a new single-storey brick building at street level; this building will contain a ticket hall, parcels office, telephone kiosks, and so on. Additional facilities are to be provided for dealing with Rugby football traffic; they include a second footbridge serving both platforms, to be used for the rapid dispersal of football crowds. The rebuilt station should be open to traffic by the end of this year.

THE SCRAP HEAP

Living up to it

Brisbane, Thursday: A man was fined here for not paying his fare. His name: Owen Fares.—From *"The Evening News."*

Summer Is Icumen In

The 5.15 p.m. train from Sheffield Victoria to Penistone 15 miles away, pulled out on time but leaving behind a number of angry passengers. The trouble was that it was the wrong starting time. Someone was using a *summer* timetable, which is 15 minutes earlier than the winter schedule. Officials found another engine and some more carriages to take the left-behind passengers.—From the *"Daily Express."*

Spotters, Spotters Everywhere

The names "Kikuyu" and "Mau" meant something more pleasurably exciting to British readers fifty years ago than they do now. For the trunk line across Kenya from Mombasa to Lake Victoria had just been completed. The branch line to the lake climbs out of the Rift Valley over the Mau escarpment and reaches its tree-clad summit at 8,300 feet. The trains are hauled over these heights by enormous Beyer-Garratt locomotives, driven by Europeans. And at every station, boys being the same the world over, a small open-mouthed throng surrounds the engine and looks in admiring envy at the driver.—From *"The Manchester Guardian."*

B.R. Container Reaches Alpine Village

The British Railways furniture container illustrated below on its arrival at Adelboden in the Bernese Oberland is believed to be the first such consignment to have negotiated the mountain road from railhead at Frutigen on the Bernese-Lötschberg-Simplon Railway. The container might have been consigned by



The first British Railways furniture container to reach Adelboden in the Bernese Oberland

any of British Railways nine or ten routes to Switzerland. The road journey from Frutigen was made difficult by ice-bound roads.

Clearing the Air

A bus strike in New York has been acclaimed by some as an advantage to the city because the subways have shown themselves able to handle the extra passengers, traffic moved more freely on the streets, and the city had smelt cleaner because of the absence of fumes. One letter on the subject to a New York paper read: "New York has never been so pleasantly quiet. In the absence of the gasping and grinding, honking and smell of the buses, the city has gained a charm unequalled since Fifth Avenue was a meadow."

Paddington, 1862—Hanover, 1953

An illustration in a German newspaper sent us by a correspondent shows the reception of the Queen of the Hellenes on her recent arrival at Hanover Hauptbahnhof. In the background, on the wall of what seems to be a waiting room, is a reproduction of W. P. Frith's well-known "Railway Station." This was painted in 1862, and depicts Paddington shortly before departure of a G.W.R. broad-gauge train. It would be interesting to know how this picture came to hang in Hanover station, where it seems, though essentially British, to have survived both wars.

Sights of London

Londoners who look on their railway stations as places to enter and leave as smartly as possible may be surprised to hear that they are regarded with more than usual interest by some travellers. Paddington, I hear, has been listed by the Ministry of Local Government & Planning as a building "of special architectural and historic interest." Kings Cross is regarded generally as "architecturally the finest terminus." Euston's triumphal arch and central meeting room and offices are specially listed; and the Ministry has an eye for the huge single-span steel roof of St. Pancras.—From *"The Star."*

Train Catering in South Africa

The dinner menu of a South African Railways restaurant car sent us by a correspondent who partook of it last October, offered seven courses—for 4s. 6d.: soup, fried fish, noisettes of lamb, sirloin of beef, sweet, cheese, and dessert, with coffee included. The menu is in English and Afrikaans. The names are given of the chief steward and the chef.

On the back of the menu is recorded the fact that the first South African restaurant car was placed in service in 1894; today there are over 100 cars controlled by the S.A.R. Catering Department, serving 4,000,000 meals a year.

The current S.A.R. timetable, in force from November 24, 1952, gives the price of dinner in ordinary trains as 5s., and

Dulce (Astra-) Domum



"It's time I introduced myself before all these dark tunnels go to waste"—*"South African Railways & Harbours Magazine"*

7s. 6d. in *de luxe* trains. Meal coupon books for three meals cost 11s. 6d. Besides *table d'hôte*, meals, there is a comprehensive *à la carte* service.

Rhymes for the Times—

On Looking into "Facts About British Railways"

I read a book the other day,
A volume sleek and slim,
Crammed full with facts and figures
And chock-a-block with vim.

You'd think, to read the newspapers,
That everything was lost,
That this old transport industry
Was giving up the ghost.

It needs a bit of pruning,
To eradicate decay,
But life will flow more freely when
The dead wood's cut away.

I've felt quite sore, myself, at times
And belly-ached a lot.
But what's the use of moaning that
The system's gone to pot?

There are some cross-grained people
Who'd like to wield an axe,
But even they pipe down when once
Confronted with the facts.

And, soon, the self-styled experts
Will gnaw their nails with rage
And call us quite unfit to cope
With this atomic age.

Tell them (if proof is needed
Of our essential worth)
"We move more tons more quickly here
Than anywhere on earth."

But, in the last analysis,
It seems quite obvious
That whether railways live or die
Largely depends on us.

So, down with denigration—
It only wastes and warps,
Let's pull our weight and demonstrate
A pretty lively corpse!

OLD-TIMER

E 2

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

CANADA

C.N.R. Diesel Haulage in West

Two daily fast freight trains west of Winnipeg on the C.N.R. are now diesel hauled. As more locomotives become available and crews are trained to handle them, diesel haulage will be extended to Edmonton, and it is also intended to increase the frequency of the service to three daily trains each way.

In addition to the diesel locomotives on fast freight service between Winnipeg and Toronto and between Winnipeg and Montreal, the C.N.R. now has eight road diesel units operating out of Winnipeg. Ten more diesel units are expected shortly for operation in Western Canada. Most of the C.N.R. freight trains between Winnipeg and the head of Lake Superior are now diesel hauled.

UNITED STATES

More Dieselisation

The impending delivery of thirty additional diesel units to the Southern Railway, at a cost of \$5,000,000, will complete the dieselisation of this company's system, which extends to 7,793 route miles, and will be the largest in the United States so far to supplant steam entirely by diesel power. At about the same time the 1,816-mile Central of Georgia Railroad, an independently-operated subsidiary of the Illinois Cen-

tral System, after receiving twelve 1,600-h.p. road-shunters and twelve 1,200 all-purpose branch line units on order, will dispense with its last remaining steam power in regular service.

In November, 1952, the Erie Railroad received from the builders the last two 1,600-h.p. freight units needed to complete the dieselisation of all freight working over the 2,239 miles of its system. This company's steam locomotives now have been reduced in number to 46, of which 30 only remain in active service, on suburban passenger trains in New Jersey. The Erie diesel fleet now comprises 467 units, with five more on order.

The St. Louis-Southwestern, with 1,570 route miles of line, is now also an all-diesel system. One hundred and twenty-five diesel units are required; its last remaining 55 steam locomotives are either in store or leased to other railways.

New Seaboard Air Line Yard

Before the end of February work is to begin on a \$7,000,000 marshalling yard at Hamlet, North Carolina, an important traffic centre 254 miles south of Richmond, Virginia, on the main line of the Seaboard Air Line from Richmond to Miami. The hump classification yard will have 58 tracks each with a capacity from 12 to 60 bogie wagons, and space will be reserved for expansion to 80 tracks if and when necessary. The work will necessitate the moving of

1,000,000 cu. yd. of material and the laying of 66 miles of new tracks; equipment will include automatically-controlled switching and wagon retarders.

The flat classification yard for assembling freight trains will comprise ten tracks with capacities from 135 to 165 bogie wagons each, and the departure yard will have ten tracks each accommodating 110 to 150 wagons in the departure yard. There will also be two 50-wagon cleaning tracks, two 20-wagon light repair tracks, two tracks holding 20 cabooses each, one track for 20 explosives wagons, and a track holding ten livestock tracks. A diesel repair shop costing \$1,500,000, equipment included, also forms a part of the scheme. The scheme is expected to reach completion by the end of 1954.

Erie Main Line Diversion

The Erie Railroad has opened a new 7-mile line through the outskirts of the city of Corning, 292 miles from Jersey City, on its main line from New York to Chicago. The original line had 25 level crossings, all of which are now abolished. Construction of the new line has included new passenger and freight stations, 21 major structures crossing roads and streams, and some 2,000,000 cu. yd. of earthworks. The work has cost approximately \$12,000,000 and is the largest diversion scheme carried out in the State of New York.

Western Pacific C.T.C.

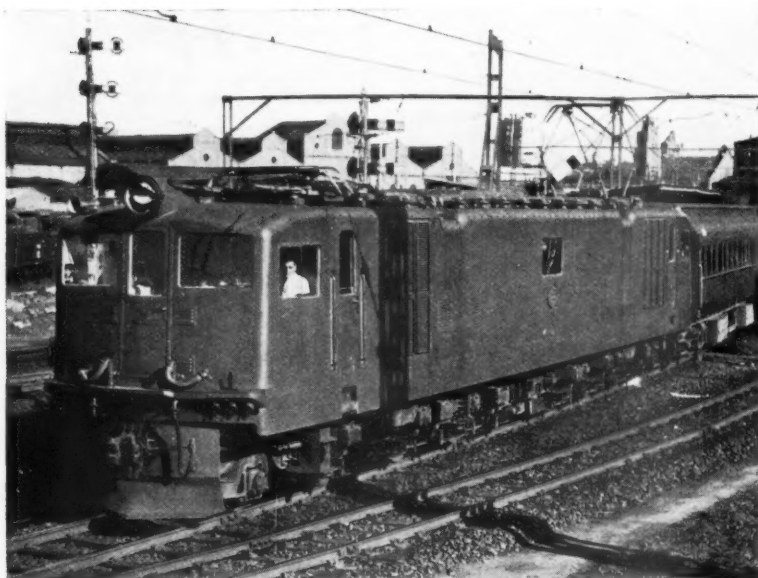
In November centralised traffic control was introduced on the 72-mile section of the Western Pacific between Wendover and Delle, Utah. Of the 924 miles of line between Salt Lake City and Oakland (San Francisco), 94 per cent is controlled by c.t.c. equipment. Over the 178 miles between Alazon and Weso, where the Western Pacific main line and the Southern Pacific Ogden - Oakland line run parallel, the two are operated jointly as a double track, all westbound trains using the S.P. track and eastbound trains the W.P. track.

BRAZIL

Railway Reform Programme

President Vargas has approved two more projects by the Brazil-United States Commission, involving loans of U.S. \$6,354,000 and U.S. \$7,040,953 from the Washington banks to finance imports of railway material. The former is to supply the North Western Railway with 16 diesel locomotives, 543 wagons, and quarry and repair shop equipment. The additional expenditure is estimated at £11,070,000.

The second loan, for which application is being made to the World Bank, is to purchase foreign currency for imports of 12 diesel-electric locomotives.



One of the 1-Co+Co-1 "4 E" 3,030 h.p. locomotives, built by the North British Locomotive Co. Ltd., and the General Electric Co. Ltd., which are now entering service on the South African Railways

wagons, and quarry and repair shop equipment and materials for the electrified section of Rêde Mineira de Viacao. Improvements to permanent way installations will cost the equivalent of £14,000,000 in cruzeiros. The Rêde Mineira, which extends for 2,300 miles through the States of Goiás, Minas Geraes, Sao Paulo and Rio de Janeiro, has been in financial difficulties for some years. The Minas Geraes State Government, which operates the line on a lease from the Federal Government, has asked the latter to rescind the contract and a Bill is now before Congress.

In November, the National Bank for Economic Development, created to administer funds for carrying out the Government's development plans, signed the contract for a loan in cruzeiros, equivalent to £23,620,000, to the Central Brazil Railway. This sum will finance five projects for improvements to permanent way, rolling stock, and installations. The necessary imports are covered by the U.S. \$12,500,000 loan, authorised by the World Bank.

ARGENTINA

Modernised Stock for Bariloche Service

In coaches modernised for the Bariloche services of the General Roca Railway the dust nuisance has been overcome by a regulated air system for the sleeping and dining cars. Two electric fans in each coach take in air from outside and pass it through two filters, one wet and the other dry, distributing it afterwards through a central conduit to each compartment. This and the use of double windows effectively prevent dust from entering, particularly as the air pressure inside the coach is slightly higher than that outside. Electric heating for winter services has been installed.

ISRAEL

Rehovoth-Beersheba Line

Construction of a line between Rehovoth and Beersheba began in November. This line is to afford a connection with southern Israel, hitherto linked with the rest of the country by road only. It is intended to extend the line later to Kurnub, near the Negev mineral deposits, and so reduce the high cost of conveying minerals to the ports. The building of the line is to be financed by American aid funds, reparations from Germany, and foreign loans.

SYRIA

Damas Hamah et Prolongements Railway

From the report for 1951 of the Chemin de fer de Damas Hamah et Prolongements it appears that despite intensified road competition the working receipts for the year were higher than in 1950, a feature which was more pronounced in respect of the standard-gauge traffic. This favourable development was mainly attributable to traffic in connection with the building of pipe-

lines in Iraq, and increased traffic from Iraq. The working expenditure was lower than in 1950. The company accepted during the year the Syrian Government's invitation to negotiate conditions in which the company would be prepared to forego its rights under the concession relating to its lines in Syrian territory. These negotiations are still in progress.

SPAIN

Zamora-Corunna Line

The use of diesel traction on the new Zamora-Orense-Corunna line under construction is being considered because of the many tunnels, particularly between Puebla de Sanabria and Orense, where there are 88, totalling 26 miles in length.

Plan for New Madrid Atocha Station

A plan has been prepared for a new station at Atocha Station, Madrid. The present terminus is insufficient for traffic needs and it is proposed to rebuild it on the same site and form a connection with the Madrid Junction line now under construction. When the Recoletos tunnel on this line is completed local trains from south of Madrid would be able to run through to Nuevos Ministerios. Services from the west now terminating at Delicias would be transferred to the new Atocha Station.

SAN MARINO

Rimini-San Marino Railway

Negotiations in progress with Italy cover the reconstruction of the 15-mile narrow-gauge line connecting San Marino with Rimini, on the Italian State Railways. The line was partly destroyed and partly dismantled during the war. San Marino demands that Italy should bear the cost both of reconstructing and working the railway for 25 years.

FRANCE

Metro Traffic in 1952

The Paris Metro was the means of transport most largely used by the public in 1952, according to figures issued by the National Statistical Institute. The number of Metro passengers rose to more than 3,000,000 a day, compared with 2,300,000 on the buses. The daily average number of passengers on the S.N.C.F. main lines was 750,000, an increase of 5 per cent for the year.

Level Crossing Legal Decision

A legal decision concerning the responsibility of the S.N.C.F. for accidents at unguarded level crossings has been given by the Supreme Court of Appeal (Cour de Cassation). The Paris Court of Appeal on June 7, 1948, gave judgment in the case of an accident at an unguarded crossing on the Poitiers-Limoges line, where a doctor driving his car across the line was killed by a train. The court's decision divided the responsibility, imputing two-thirds to the victim and one-third to the S.N.C.F. in-

volving a payment of about fr.400,000 to the doctor's heirs. This decision was repealed by the Supreme Court, which held that railways must take requisite measures to warn road users approaching a level crossing.

Movement of Prefabricated Track

The S.N.C.F. is conveying 59 ft. lengths of prefabricated track for distances up to 37 miles from assembly areas to site. To facilitate this movement, a vehicle known as a *couplage* has been evolved which can each carry three lengths of prefabricated track at up to 25 m.p.h.

The *couplage* is composed of two four-wheel bogies on which is superimposed a chassis 59 ft. long, made up of braced iron sections. If required, a 78-ft. chassis may be used. Salvaged buffers with widened bearing surfaces, and draw hooks are fixed to the cross-girder separating the longitudinal iron sections. Every alternate *couplage* in a train is equipped with compressed air brakes, most of the material being salvaged from wagons withdrawn from service.

CZECHOSLOVAKIA

Prague Stations Renamed

For the fourth time within a generation the three main stations in Prague have been renamed. Until the collapse of Austria-Hungary they were known as Franz Josef, Staats (State Railway), and Nord-West. The Staatsbahnhof was subsequently called Masaryk, after T. G. Masaryk, the first President of Czechoslovakia and the Franz Josef and Nord-West became the Wilson and Denis stations respectively, in recognition of the part played by Woodrow Wilson, the President of the U.S.A., and Professor Ernest Denis, the French historian, in helping to secure Czechoslovak independence. When they occupied Czechoslovakia in 1939, the Germans renamed the stations Hauptbahnhof (main station), Hibernerbahnhof (after a nearby street) and Moldaubahnhof (after the German form of the name of the Vltava, on which Prague stands). After the liberation in 1945, the pre-occupation names were restored but on January 1 last new names were given to them—Hlavní nadraží (main station), Centrální nadraží, and Praha-Tesnov.

IRELAND

Central Kitchen for C.I.E.

A central kitchen to supply all C.I.E. restaurant and buffet cars and the station buffets in the Dublin area operated by the Hotels Department is to be constructed at Kingsbridge Station, Dublin. In winter, meats, soups, minces, sweets, and other hot meals served on dining cars will be cooked or part-cooked. In summer, all food will be fully cooked at the central kitchen, and hygienically packed in cellophane on being despatched to the buffet cars. Fried dishes and grills will continue to be cooked on the restaurant or buffet cars.

PUBLICATIONS RECEIVED

The Wire Reference Year Book and Directory. 1952-53 edition. Wolverhampton: Alfred Hinde Limited, Clarence Street. 9½ in. × 6 in. 192 pp. Price 25s.—A second issue has appeared, dated 1952-53, of "The Wire Reference Year Book and Directory." A large amount of additional material has been incorporated in the Buyers' Guide section, which now is arranged with a geographical coding system which has increased the compactness of the volume, and, as pointed out in the foreword, has enabled its price to be reduced by 5s. In addition to the directory sections, details are given of processes used in wire production and certain manufacturing applications of wire, such as the wire-weaving industry. The bibliography is extensive and includes a number of American works.

Current British Directories, 1953. Compiled by G. P. Henderson. London: Staples Press Limited, Mandeville Place, W.1. 8½ in. × 5½ in. × 1½ in. 237 pp. Price 30s.—Many queries arising from day to day in industrial firms could be settled with less loss of time to the questioners and others if there was access to the most appropriate sources of information. The present directory lists the current local, regional, and telephone directories now published in this country, in alphabetical order. In Part 2 there is a list of specialised directories covering particular trades, provincial bodies, and trade associations. The final section of the book lists international specialised directories published abroad which are of use to British readers. In the three main sections directories are listed alphabetically according to their titles, but a combined alphabetical index under subject headings covers the whole volume.

Narrow Gauge Rails in Mid-Wales. By James I. C. Boyd. South Godstone, Surrey: The Oakwood Press. 8½ in. × 5½ in. 146 pp. Illustrated. Price 22s. 6d.—This carefully but brightly written historical survey of the narrow-gauge systems in Central Wales, both living and defunct, embraces the Corris, Talyllyn, Glyn Valley, Fairbourne Miniature, Rheidol, and Welshpool & Llanfair systems, and minor tramways. The description of the routes, rolling stock, and traffic working is painstaking, and the past history and present revivals of the Talyllyn and Fairbourne Miniature Railways are described in an entertaining style. The photographic illustrations and the diagrams of rolling stock are on the whole good, but some station plans are not clear. The treatment by the G.W.R. of the Rheidol leads to speculation why the Southern did not similarly prolong the existence of the Lynton & Barnstaple, instead of closing it as unremunerative at the earliest opportunity. Of the Rheidol today, Mr. Boyd says: "There is no lack of evi-

dence as to the popularity of the branch... though no effort appears to be made to advertise and promote its services."

Japanese National Railways: Progress of Eighty Years.—This illustrated booklet, published by the Japanese National Railways, Tokyo, is a pictorial record of the system since the first railway in Japan was opened in 1872. Some of the photographs reproduced are of considerable historical interest, as of a train on the opening day and of an early electric locomotive and multiple-unit stock. Other illustrations depict the fitting within 24 hr., after eight years' preparation, of stock over the entire system with automatic couplings on July 17, 1925. Recent developments illustrated include postwar steam and electric locomotives and rolling stock, automatic signalling, train ferries, marshalling yards, freight handling equipment, stations rebuilt since 1945, and the interior of the Kammon submarine tunnel. On the front inside cover a contemporary Japanese painting is reproduced of the Emperor at the opening ceremony on October 14, 1872.

Argonarc Spot Welding.—A descriptive leaflet describing the Argonarc spot welding process, details and specifications of the equipment, and method of operation, is issued by the British Oxygen Co. Ltd. The process is suitable for flux-free spot welding stainless steels, tack welding in assemblies, and also for certain non-ferrous metals. The advantages claimed for the process include its ability to join thick and thin sections; it may be used in positions inaccessible to conventional spot welding, and, since the arc is screened by the torch nozzle, can be used without inconvenience to staff in the immediate vicinity. The equipment is portable, and the operating cycle being automatic, requires no skill by the operator except for positioning the torch and working the trigger switch of the apparatus.

Head Wrightson Group Products.—A pictorial survey of the products of the Head Wrightson Group of companies, both in this country and overseas, is contained in an attractive 60-page book published by the Group. The activities of the Group cover a very wide range in the field of engineering, which includes the design and manufacture of equipment for processing coal, oil, iron and steel and non-ferrous metals, and the supply of equipment to and components for railways, road vehicles, and aircraft. Among the numerous products illustrated are 30/45-ton ore hopper wagons with bottom doors, a 75-ton hot metal ladle with double-bogie carriage, an air-operated dump car of 50 tons capacity, and designs of electrically-propelled scale and transfer cars; the last-named have a capacity of 100 tons, bottom side discharge. The Group also manufactures carbon steel,

manganese steel, and alloy steel castings up to 15 tons in weight which can be supplied rough or finish machined. The combined output of the iron foundry division is approximately 50,000 tons a year, consisting of railway chairs and base plates, and tunnel segments from 5 ft. to 35 ft. in diameter. The Head Wrightson Machine Co. Ltd., a wholly-owned subsidiary of the parent company, undertakes the manufacture of individual machines or complete plant, and will act as consultants on new projects.

Loaders and Dumpers.—We have received from E. Boydell & Co. Ltd., two illustrated booklets describing the Muir-Hill loader and the Muir-Hill model 10B dumper. A feature of interest is the adoption of diesel power as standard in these machines. There have also been changes and developments in the gearbox, chassis, and suspension, details of which contribute to increasing the usefulness and versatility of these appliances. Technical details of this type are illustrated by means of photographs and diagrams.

Journey round the World.—This year's illustrated booklet issued to shareholders of the General Electric Co. Ltd. tells the story of an imaginary journey round the world in a "Comet" airliner calling at various places where large installations of G.E.C. equipment are to be seen. The illustrations include a view on the Bulawayo-Gwelo section of the Rhodesia Railways, where C.T.C. has been provided by the Siemens and General Electric Railway Signal Co. Ltd.; diesel-electric locomotives being delivered at Colombo Harbour for the Ceylon Government Railway; and rolling stock for the Estoril Railway of Portugal. Other examples of electrical apparatus in transport service include remote control equipment for substations on the Melbourne suburban system of the Victorian Railways, and the relay interlocking panel at Liverpool Street Station.

All-In Holidays to Scotland by Special Trains.—The Creative Tourist Agents' Conference, the joint enterprise of several leading British travel agencies which originated the "William Tell Special" and other special trains as the basis of inexpensive inclusive tours to the Continent, has, in conjunction with British Railways, issued its 1953 programme of special train tours to Scottish holiday resorts from Manchester, Nottingham, Sheffield, and some intermediate stations. Two trains will be operated weekly, one from Manchester and the other from Nottingham on Saturdays from June 13 to September 5. Apart from the low cost of the holidays—from £14 4s. for eight days—the trains should help to solve, as the "William Tell" did, the problems of holidaymakers, hoteliers, and railway operating staffs.

Point Operation by Hand-Generator

*Installation on Western Railway
is first of its kind in India*



North-west end of crossover, showing point machine on right

IN connection with the doubling of the line between Anand and Barejadi, on the north-west broad gauge main line of the Western Railway, India, fairly extensive track alterations had to be undertaken at the north end of Anand yard. Anand is an important junction with the Anand-Godhra chord line and the Anand-Cambay branch. The chord line forms the base of a triangle with the north-east and north-west main lines, which meet at Baroda. It runs from Anand on the north-west to Godhra on the north-east main line. Although this chord line has brisk passenger traffic, including very heavy seasonal pilgrim traffic to Dakor, there

main line so that the connections form a triangle. The increase in traffic density consequent on doubling necessitated laying an additional line from the chord to the north-west main line so that this portion of the triangle is double as well as the main line. Considerable signalling alterations were necessary.

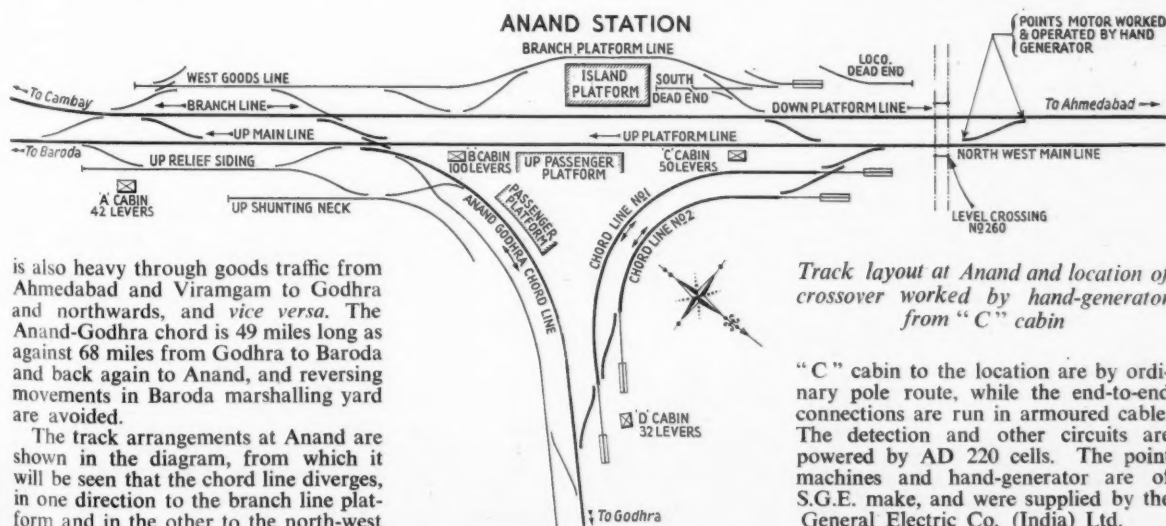
Anand yard is controlled by four signalboxes, "A" cabin, 42 levers, "B" cabin, 100 levers, "C" cabin, 50 levers, and "D" cabin, 32 levers. All signalling and point operation is mechanical and important running signals are controlled by electric key transmitters released by a 44-slide instrument in the deputy stationmaster's office. Tyer's

No. 7 tablet token instruments and three-position double-line instruments, of the same make, with lock and block features, are in use in the area.

The doubling of the triangle necessitated the laying of additional points and the re-positioning of existing ones. "D" signalbox, which contained a 16-lever frame, was demolished and a new cabin housing the 32-lever frame previously mentioned was built. The track alterations at "C" signalbox could be accommodated within the scope of the existing lever frame with the exception of a crossover between the up and down lines essential for the triangle lines. This crossover, No. 31/34, is 1,336 ft. from the centre of "C" box. The limit of manual operation, as prescribed in the rules, is 1,050 ft. for points with a separately-operated F.P.L. and bar, and 600 ft. for an economical layout.

If a lever frame is used with an 8-in. stroke at the lever tail the distance could be extended to 1,500 ft. and 900 ft. but these distances are governed by the physique of the operators and the frequency of lever movements. In the case of crossover 31/34, hand-generator operation was decided on and this decision was to some extent influenced by the fact that a complete set of equipment was already available in signal stores for emergency working.

Since this was the first installation of its kind, the layouts and associated apparatus and circuits were put down in the signal shops for trial and it was found that operation of the hand-generator was a little stiff and tiring for the cabinman of average strength. The circuits, locking, and indicating arrangements therefore require No. 31 to lead No. 34 so that each end is worked separately. Connections from



is also heavy through goods traffic from Ahmedabad and Viramgam to Godhra and northwards, and vice versa. The Anand-Godhra chord is 49 miles long as against 68 miles from Godhra to Baroda and back again to Anand, and reversing movements in Baroda marshalling yard are avoided.

The track arrangements at Anand are shown in the diagram, from which it will be seen that the chord line diverges, in one direction to the branch line platform and in the other to the north-west

Track layout at Anand and location of crossover worked by hand-generator from "C" cabin

"C" cabin to the location are by ordinary pole route, while the end-to-end connections are run in armoured cable. The detection and other circuits are powered by AD 220 cells. The point machines and hand-generator are of S.G.E. make, and were supplied by the General Electric Co. (India) Ltd.

Prestressed Concrete Bridge on Steelworks Railway

Large skew span linking sidings across river

A NEW bridge across the River Don in the steelworks of Steel, Peech & Tozer at Rotherham is claimed to be the largest span prestressed concrete railway bridge so far constructed. It is a 160-ft. span with a large skew of $58\frac{1}{2}$ deg. and carries a single line joining

required. An additional 12 tons of mild steel bars were required as reinforcement, mainly as stirrups and in the top compression boom of the deck, and a further 20 tons of mild steel reinforcement was provided in the abutments. The end anchorage plates for the 337

slump of 4 in. The deck beams are carried on rocker bearings on one side and provision for stressing and thermal movement is made at the other end by means of two combined roller and rocker bearings.

Abnormal side clearance is provided for extra wide loads, and concrete buffers for checking overhanging loads are provided just clear of the bridge. The $10\frac{1}{2}$ -in. deck slab is prestressed by $1\frac{1}{2}$ -in. alloy steel bars at 9-in. centres. The stress distribution in the concrete deck at midspan, after allowing for full creep and shrinkage losses, is 1,783 lb. per sq. in. compression to 65 lb. per sq. in. tension in the unloaded slab. With the dead load of the track the small tension is removed, and with full live load the stresses reduce to 148 lb. per sq. in. compression and 1,610 lb. per sq. in. compression at the top.

Main Girders

The disposition of the high tensile alloy steel bars in the girder beams at midspan and the bending up of the bars at the end of the beam are shown in Fig. 2.

The stress conditions under dead load after full shrinkage and creep losses are compressions of 517 lb. per sq. in. at the top and 1,620 lb. per sq. in. at the bottom. Under full load and impact these become 1,864 lb. per sq. in. and 261 lb. per sq. in. compressions respectively. In assessing these values the steel has been ignored, but the effect of its inclusion would be small.

The maximum shear at the ends of each beam under full load is 325 tons giving a nominal maximum shear stress

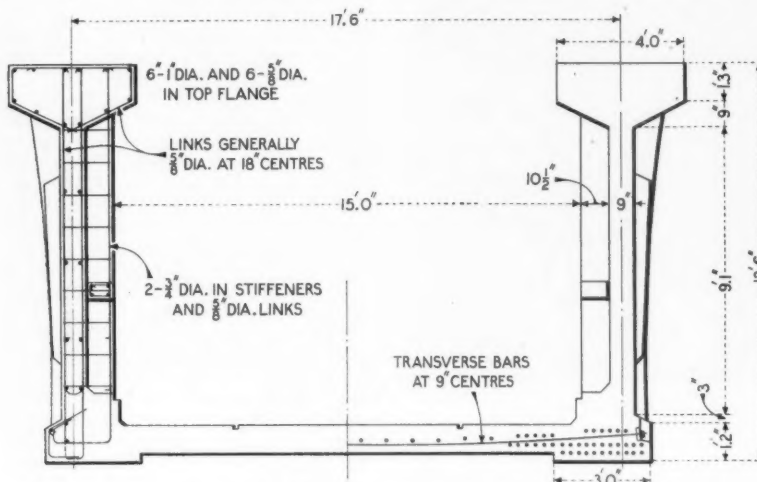


Fig. 1—Section through deepest parts of girders showing position of reinforcing bars

industrial sidings on each bank of the river. To clear the maximum river flood level, it has been necessary to raise the approaches and to keep the underside of the deck above it, and also to use a shallow deck thickness.

Single Span Adopted

It was found to be more economical to provide a single large-span structure, rather than to use a central pier necessitating a widening of the river. The shallow construction depth secured by a thin deck slab enabled the raising of the approaches to be reduced to a minimum.

As shown in Fig. 1, the main girders are 4 ft. wide and 12 ft. 6 in. deep at the centre of the span, and 9 ft. at the supports. They are spaced at 17 ft. 6 in. centres and the deck slab spanning between is $10\frac{1}{2}$ in. thick. Web stiffening ribs are provided at intervals between the deck slab and the compression flanges of the girders.

The bridge was designed for 20 unit live loading in accordance with normal railway practice, providing for a standard train with 20-ton axles at 5-ft. centres plus a lower than normal impact factor of 17.4 per cent in view of the low speeds. The large girder depth was provided to reduce the deflection on the side of the deck opposite the forward bearings of each skew abutment; this also reduced the steel quantities, the exceptionally low total weight of only 28.4 tons of high tensile steel bars being

high-tensile Macalloy bars had a total weight of 3.65 tons.

The abutments are of the cellular counterfort type in reinforced concrete supported on 8-in. \times 5-in. R.S.J. piles; the foundations are taken down to 9 ft. below the river bed. The concrete mix was 1:2:4 throughout with a maximum

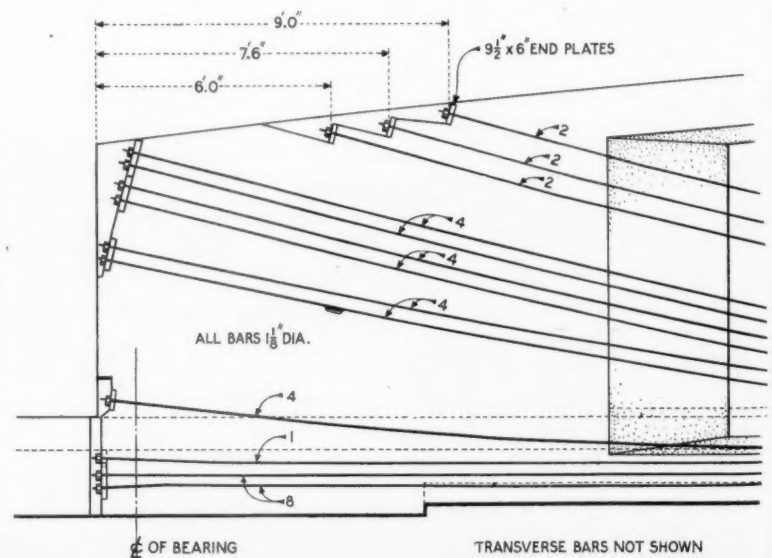
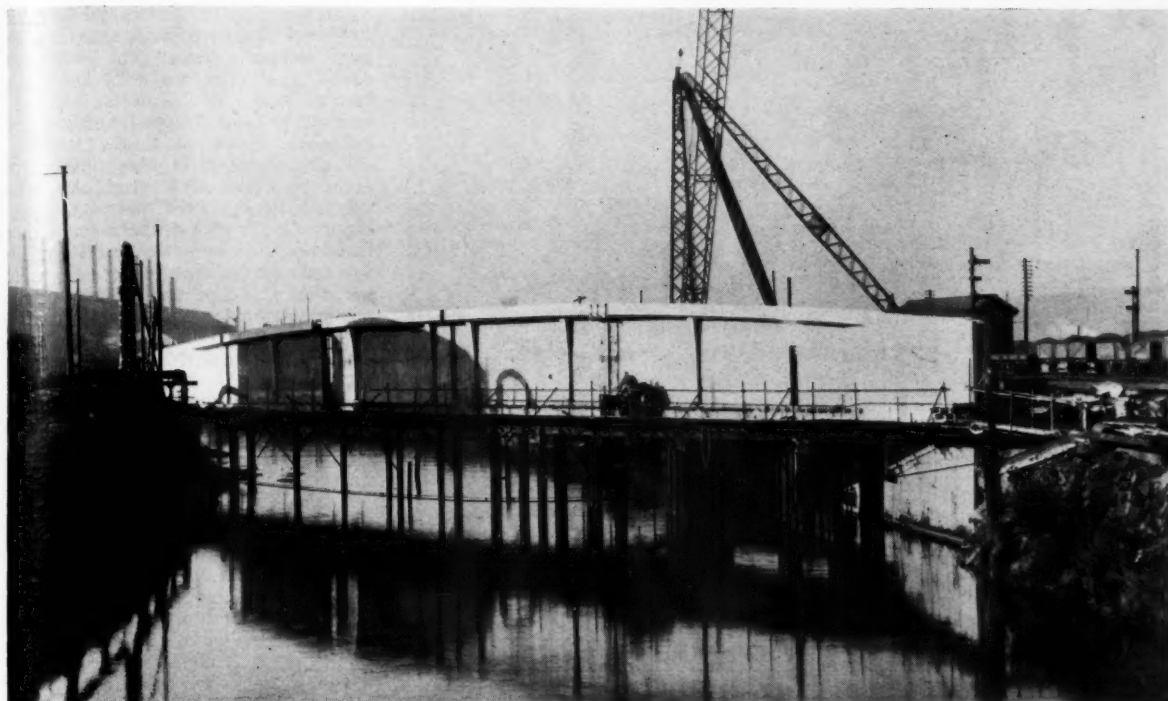


Fig. 2—Details of end of beam



General view of bridge

of 404 lb. per sq. in. The maximum principal stresses are 1,142 lb. per sq. in. compression and 142 lb. per sq. in. tension. The calculated upward deflection of the structure on applying the prestress was 1.99 in. which exceeded the calculated deflection under full dead load of 1.24 in. A slight camber of 3 in. was provided in the span.

Composition of Concrete

For the superstructure the mix was 112 lb. of rapid-hardening Portland cement to 162 lb. of sand with coarse

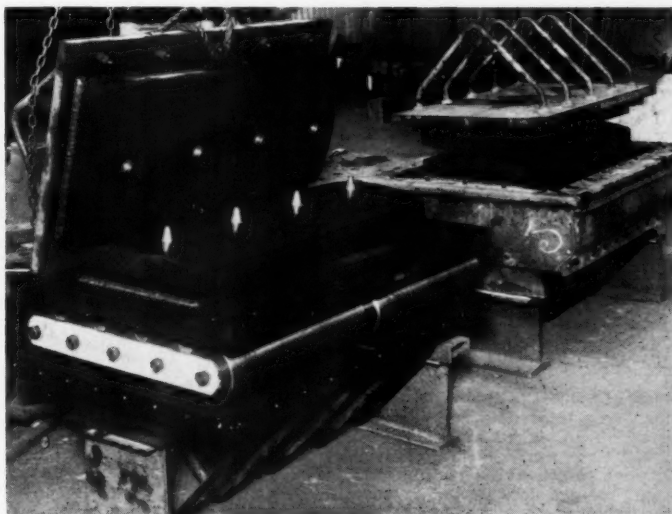
aggregate, made up of 145 lb. of $\frac{1}{2}$ in. down and 235 lb. of 1 in. down to $\frac{3}{8}$ in. The aggregate was almost entirely siliceous with reasonably rounded particles.

The specified 28-day cube strength was 6,250 lb. per sq. in. and the actual test cube strengths obtained varied between 7,000 and 8,000 lb. per sq. in. with occasional higher results. The water/cement ratio for the deck slab and the compression booms of the girders was 0.38, increased to 0.42 at the bottom of the girders where the closeness of the rubber tubes forming the

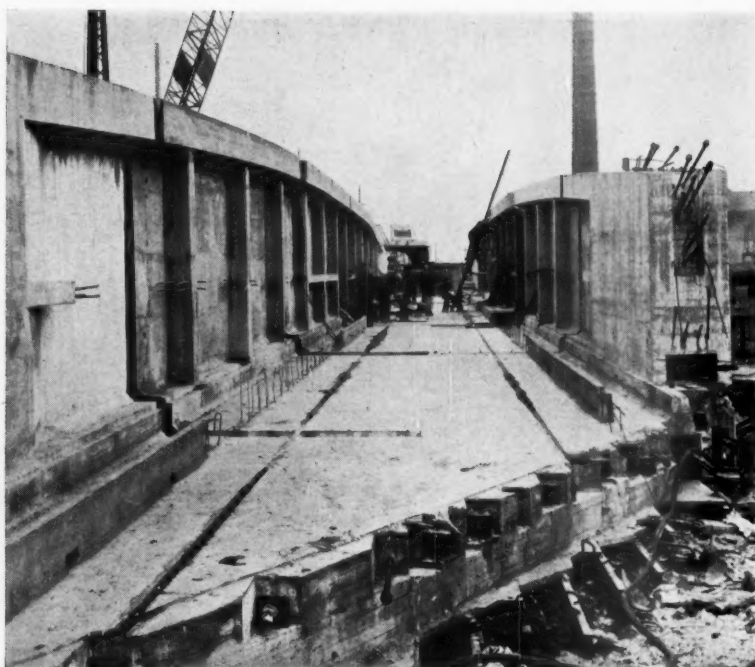
ducts and the secondary mild steel reinforcement made flow and compaction under vibration more difficult.

The concrete was compacted by a combination of one electric hammer on the formwork and two internal poker type vibrators, while the test cubes were compacted by electric hammer. The ducts for the 337 high tensile alloy steel bars were formed partly with soft rubber tubes with a loose bar inserted and partly with inflated Ductube.

To insert the bar couplers, and reduce shrinkage tension in the concrete



(Left) Transverse prestressing of the deck, and (right) free end bearings



View of bridge girders before concreting gaps and stressing

before stressing, the girders and the deck slab were concreted in six sections with gaps between. These gaps were concreted only after the bars had been placed and the couplers correctly screwed on and wrapped to allow the necessary movement during stressing. The ducts were $1\frac{1}{2}$ in. dia. minimum to take the $1\frac{1}{2}$ -in. alloy steel bars, and increased to $2\frac{1}{2}$ in. dia. where couplings occurred. The bulk of the concrete thus had ample time to harden so that shrinkage and creep losses after stressing were lower than normal, and stressing of the girders was allowed seven days after concreting the gaps. The bars were grouted in immediately after prestressing.

The accepted tender for the complete bridge was just under £34,000, of which £14,000 represents the cost of the abutments and piling and £20,000 the staging and superstructure.

The design was prepared by Mr. D. H. Lee, Consulting Engineer to Steel, Peech & Tozer. The general contractors were George Longden & Son Ltd., Sheffield. The high tensile alloy steel bars for the prestressed concrete were made and supplied by McCall's Macalloy Limited, of Sheffield, and the bridge bearings were supplied by Joseph Westwood & Co. Ltd.

IMPROVED PARCELS TRAFFIC FACILITIES AT ABERDEEN.—The Scottish Region announces plans for altering the premises at Aberdeen Passenger Station to provide increased parcels office accommodation and better facilities for dealing with parcels traffic. The forwarding office is to provide increased public accommodation, with one-way traffic in and out of the office. The flow of traffic through the inwards office is at present impeded by structural features, which will be removed. Besides modernising the office accommodation, improved staff amenities will be provided.

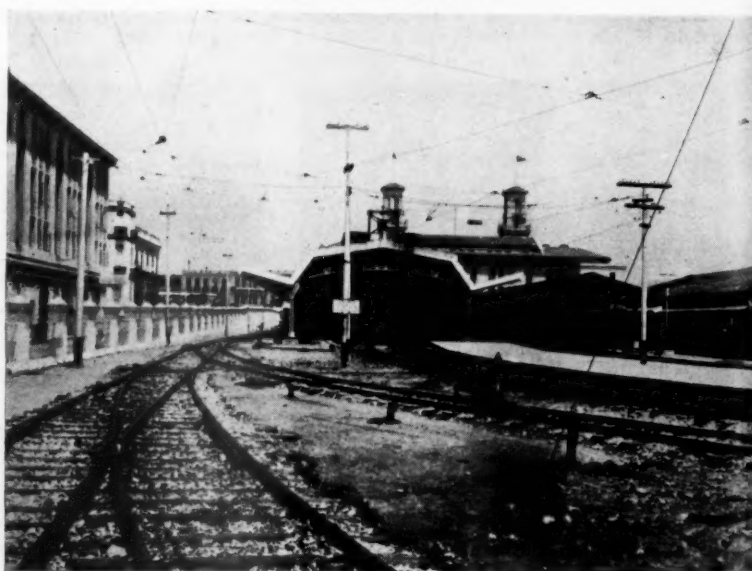
BRITISH STANDARD FOR PACKAGING CODE.—A new standard (B.S. 1133, Section 7: 1952) has been published by the British Standards Institution. This gives much information on the manufacture and use of almost all types of paper and board packaging materials. In the field of more rigid containers, the new section of the Packaging Code deals with paperboard cartons and boxes, moulded pulp containers, fibreboard packing cases and fibreboard and composite drums. It also includes 23 methods of test for the performance of many of these containers and wrapping materials. Copies of the new publication are obtainable from the British Standards Institution, Sales Branch, 24, Victoria Street, London, S.W.1, Price 17s. 6d.

NEW PREMISES FOR B.S.I.—The British Standards Institution has announced that it will move at the end of next summer into a single, self-contained office block at 2, Park Street, Mayfair. It is well over half-a-century since the B.S.I. occupied its first office at 28, Victoria Street, London. Today the Institution spreads over seven floors of the same building and the adjoining

ing No. 24. It also occupies extensive accommodation at 24, Gillingham Street, a mile away behind Victoria Station. Although the floor-space at "British Standards House," as the new premises are to be called, is not substantially greater than

that at present occupied by the B.S.I., concentration of the staff and facilities under one roof will aid efficiency and economy, and space will also be available for all the 3,800 committee meetings which the B.S.I. convenes in the course of a year.

Havana Central Station



[Photo]

The terminus at Havana of the United Railways of the Havana which serves Western and Central Cuba

[K. Cantlie]

Iranian State Railways Locomotives

A series of 2-10-2 type locomotives with a maximum axleload of 16.72 tons

THESE new 2-10-2 locomotives for the Iranian State Railways are of an entirely new design and have been built by the Vulcan Foundry Limited in fulfilment of a contract negotiated in 1950. They are required to deal with trains of 600 tonnes (592 tons) on a grade of 1.5 per cent.; or 300 tonnes (296 tons) on a grade of 2.8 per cent where curves occur of 220 m. (722 ft.) radius. The locomotives are built to suit the standard Iranian loading gauge and a

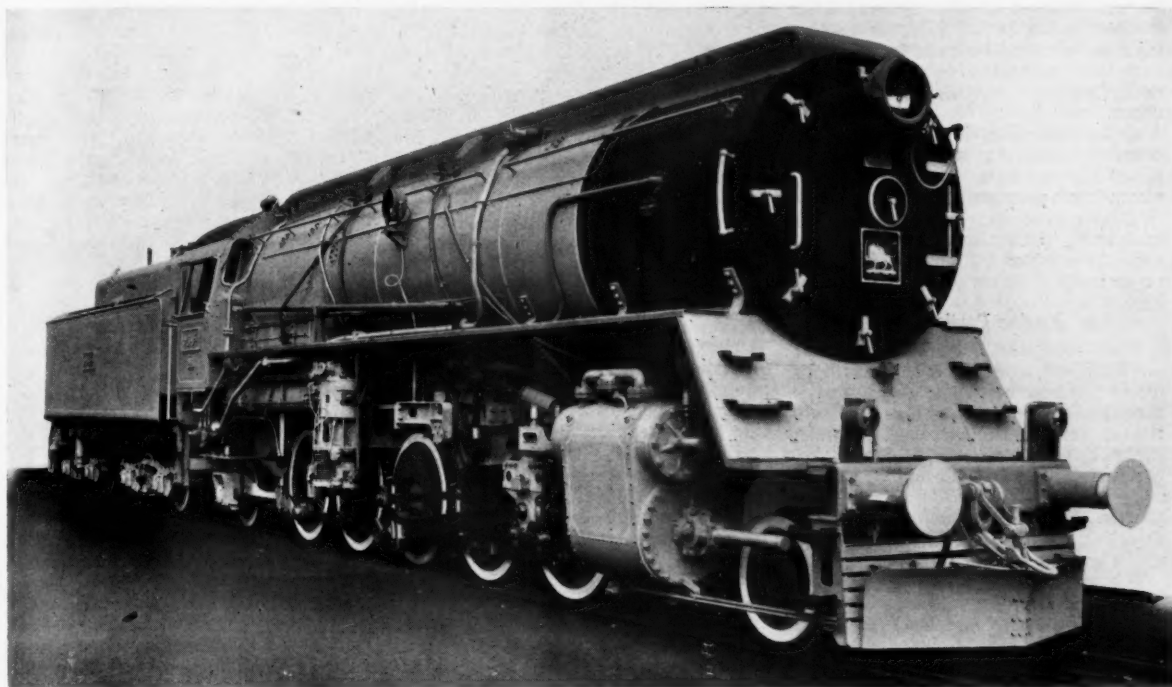
maximum permissible axleload of 17 tonnes (16.72 tons).

Boiler Design

The boiler barrel consists of two courses, the firebox being of the round top type with an all-welded steel inner box. Four rows of flexible roof stays are provided at the front of the firebox, and arranged in the breaking zones of the water spaces at the back and sides, all the water space stays being of Long-

strand steel. The roof stays are arranged radially, and the smokebox tubeplate has diagonal plate staying, the backplate being stayed by bars fixed to the second barrel plate.

The inner firebox is made particularly long to ensure good combustion of the oil-fuel without overheating in the region of the firedoor. Two domes are provided on the barrel, the front one, to which is attached the top-feed clack-boxes, being provided with a tray and



Vulcan Foundry 2-10-2 locomotive for the Iranian State Railways

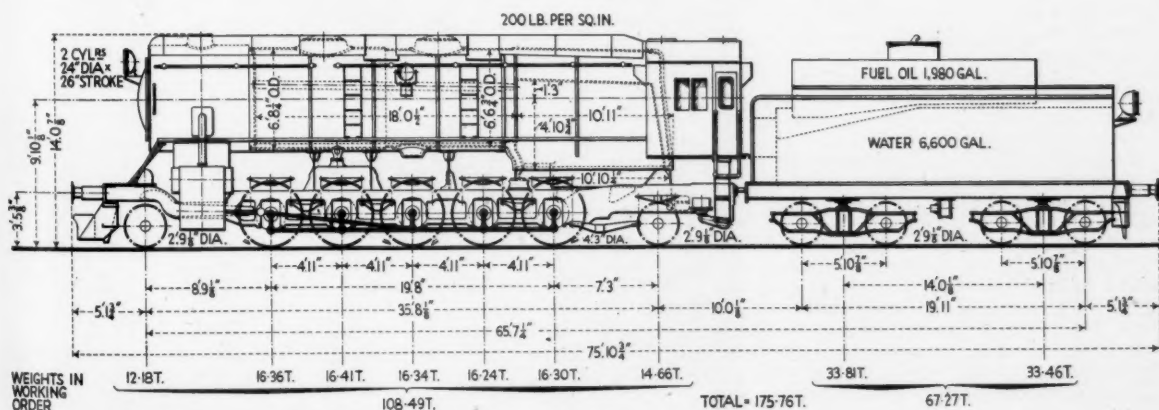


Diagram showing principal weights and dimensions of the locomotive

baffles for water purification. The rear dome houses an Owen's double-beat regulator, which is operated from a handle with ratchet adjustment on the right hand side of the firebox back-plate. A 36-element superheater is provided and both the main steam pipes and the smokebox steam pipes are made from solid-drawn steel tubes, the latter being arranged to give a very direct flow of steam between the header and steamchests.

The circular type smokebox is of generous proportions and has a large diameter door which allows easy access for cleaning the flues and tubes. The firepan is fitted with airdoor in the front walls of the two hopper shaped air intakes and is of all-welded construction. The whole of the boiler and firebox are clothed with asbestos mattresses. Water is supplied by two Davies & Metcalfe No. 11 A.S.Z. type live steam injectors, situated beneath the cab platform one on each side of the engine, delivering to the boiler at the front dome.

Other mountings include three 3 in. diameter Ross pop safety valves, two KB-D Klinger water gauges, boiler and steamchest pressure gauges and three Williams type blow-off cocks, one of each being located on the purifier dome, mud collector and firebox throat plate respectively.

Engine Particulars

The rolled steel bar frames are 4.33 in. thick and extend the full length of the engine bed, being adequately stayed throughout by steel castings and fabricated vertical stretchers. The boiler is supported at the front by the smokebox saddle and at the firebox front by a cast-steel bracket with slide. Three expansion plates are provided below the barrel and one at the foundation ring at the firebox back.

The overhead spring gear is compensated in two groups, the front group including the leading truck, leading, second and driving coupled wheels; and the rear group consisting of the fourth and rear coupled wheels and the trailing truck. The forged-steel pedestal guides are fitted with renewable manganese-steel liners, in contact with liners of the same material fitted to the axleboxes. The axleboxes are of cast steel with gunmetal bushes lined with white metal. The axlebox keeps are provided with Armstrong oilers, lubrication to the brasses being also provided from oil-boxes on the frame.

Each cylinder is cast integral with half the smokebox saddle, the cylinder barrels being fitted with cast-iron liners. All steam and exhaust passages are designed to be as direct as possible. The cast-iron front cylinder cover is fitted with a tail rod guide; the hind cover is of cast steel, carrying a single top slide-bar. The piston is also a steel casting fitted with four narrow cast-iron rings. Piston rod metallic packing of the United Kingdom type is provided in both front and hind cylinder covers.

The piston valves are 12 in. diameter, each head made up with a main ring

fitted with two narrow rings all of cast iron. The valve spindle is adjustable at the crosshead and the valves are actuated by Walschaerts valve gear, fitted at all joints with casehardened mild-steel bushes and pins. The main crosshead is of cast steel having cast-iron slippers with white-metal inserts. The connecting rods have small ends with fixed bronze bushes and adjustable big end bronze bushes lined with anti-friction metal and are also provided with adjusting wedges. The coupling rods are also fitted with solid bronze bushes lined with anti-friction metal.

The coupled wheel centres are of the SCOA-P type and are of cast steel with rolled steel tyres secured by locking rings. To help to negotiate the many sharp curves encountered in the Iranian State Railways, the distance between the intermediate and driving wheel tyres are made $\frac{1}{4}$ in. less than the leading and trailing; a thin flange is also provided on the driving tyres. Phosphor bronze hub liners are provided. The balance weights are cast solid on all except the driving wheels where lead filling is used to provide the necessary weight. All the rotating weight and 33 $\frac{1}{3}$ per cent of the reciprocating weight is balanced.

The leading truck is of the swing link pattern with a cannon type axlebox fitted with British Timken roller bearings. The trailing truck is of the radial arm type, spring side controlled, with outside British Timken roller bearing axleboxes. The Westinghouse brake equipment includes a 7 in. cross compound type T.2 air-compressor mounted under the platform on the right hand side of the engine, driver's automatic and independent brake valves, two 15 in. diameter brake cylinders on the engine, and one 14 in. diameter brake cylinder on the tender. The brake rigging on the engine is completely compensated.

The cab is completely enclosed and is provided with a double roof and wood lined sides. Padded seats and armrests are provided for both the driver and

fireman. Cylinder lubrication is provided by a 12-feed Wakefield No. 72 mechanical lubricator. Oil lubrication is also arranged for connecting and coupling rods and motion pins. The cylinder drain cocks are steam operated and the sanding valves are air operated, and large capacity sandboxes, located on top of the boiler, supply sand to the front of leading and driving wheels and to the rear of driving and trailing wheels. Other equipment includes a Laycock steam heater and a Teloc speed indicator and recorder and a steamchest pressure gauge and pyrometer indicator.

Stones 14 in. Tonum E headlamps are arranged on the front of engine and the rear of tender and a 10 in. Tonum R searchlight is fitted on each side of the engine. Buffer lamps are also provided at front and rear and also the usual gauge, cab, and motion lamps, current being supplied from a 32 V. turbo-generator located on the front barrel. The tender tanks are of welded construction and are carried on an all-welded underframe. The two four-wheel bogies are of the diamond frame pattern with British Timken roller bearing axleboxes. The locomotives were transported to Liverpool by road, and shipped from there to their destination by the Belships Co. Ltd.

The principal dimensions are as follow:—

Cylinders (2) dia. and stroke	23.82 in. x 26 in.
Coupled wheels, dia.	4 ft. 3 in.
Leading and trailing truck wheel, dia.	2 ft. 9.07 in.
Boiler pressure	199 lb./sq. in.
Heating surface	
Large tubes (36), 5.6 in. dia.	895.6 sq. ft.
Small tubes (181), 2.1 in. dia.	1,614.6 sq. ft.
Firebox	221.0 sq. ft.
Total evaporative	2,731.2 sq. ft.
Superheater (36) elements	868.6 sq. ft.
Grate area	65.7 sq. ft.
Tractive effort at 85 per cent boiler pressure	49,200 lb.
Adhesive weight	81.65 tons
Factor of adhesion	3.73
Engine : weight in working order	108.49 tons
Tender : water capacity	6,600 galls.
oil fuel capacity	8.4 tons
wheel dia.	2 ft. 9.07 in.
weight fully loaded	67.27 tons
Engine and tender weight in working order	176.76 tons

New Euston Signal Box at Night



In addition to the well-lit interior, this night scene shows the illumination of the name sign by means of fluorescent tubes under a bay

Rapid Repairs after a Californian Earthquake

Some 1,250,000 cu. yd. of earth were moved in opening out or by-passing four tunnels on the Southern Pacific



Earth-moving plant constructing the temporary 250,000 cu. yd. fill round tunnel No. 5

IN the early morning of July 21 last, southern California experienced the most severe earthquake in the State since that which did great damage in San Francisco in 1906. The intensity of the initial shock was 7.5 as against 8.25 in 1906, but it was followed by others varying between 3.8 and 5.6 during the succeeding three days.

As briefly stated in our September 12 issue the 11-mile section of the Southern Pacific Railroad inland, or San Joaquin Valley, route from San Francisco to Los Angeles, between Caliente and Rowen, suffered badly. This section is part of the 3,700-ft. ascent to the Tehachapi Pass summit, 4,025 ft. above sea level. The ruling gradient is 1 in 45 and the severe curvature includes a complete 360-deg. spiral. Four tunnels were partly destroyed and badly shattered and in four others the linings were cracked. There was much other damage also.

Work, Labour and Plant Involved

It was decided to open out the whole of the damaged parts of the four worst tunnels, Nos. 3, 4, 5 and 6, but it was subsequently found that the damage to No. 5 was so serious and extensive that to save time a diversion of the line round it had to be undertaken. The whole quantity of earthwork involved was 1,250,000 cu. yd. and, as the quickest way of attacking the problem, the Morrison-Knudsen Company was

hastily called in to move this great volume of earthwork. The contractors summoned some 500 men and brought them in by plane and train, and also concentrated a great quantity of earth-moving equipment, valued at \$3,500,000, on the site in record time, some of it coming from New Mexico by special train.

Meanwhile, the Southern Pacific administration ordered six permanent-way and six bridge gangs to the site, and the Atchison, Topeka & Santa Fe, which has running powers over this route, contributed one track and three bridge gangs. Work proceeded night and day, and, largely as a result of the work of 175 units of heavy earth-moving plant, freight traffic working was resumed on August 15, the 26th day after the worst shock, and passenger traffic on August 16, a remarkable feat considering the work involved.

Tunnels Opened Out

Though all the earthworks throughout the section were more or less seriously displaced and the track had assumed fantastic contortions, it was the tunnels that involved most of the work in the form of opening out. The eastern 200 ft. of 700-ft. tunnel No. 3 were badly damaged, the 23-in. reinforced concrete



Open cut being constructed, largely with Caterpillar D8 tractors, to replace part of tunnel No. 3

side walls being pushed inwards and the arch broken in places. This portion was opened out by excavating a cut 147 ft. deep, and the tunnel walls were broken up by pounding with 3-ton steel balls swung from cranes.

Tunnel No. 4, originally 300 ft. east of tunnel No. 3, was pushed 8 ft. nearer to it by the earthquake. The whole of its 334-ft. length was badly cracked and at one point the rails were 4 ft. above the floor. This tunnel was replaced by a cutting 181 ft. deep, but its walls were left standing as retaining walls.

Extensive landslides occurred between tunnels Nos. 4 and 5, and the following damage was sustained by 1,170-ft. tunnel No. 5. The west portal was

broken up and the first 600 ft. of the walls and arching were damaged. In the remaining 570 ft. the tunnel was blocked at two points 360 ft. apart. The concrete lining between the blocks was eventually found to be damaged beyond repair. As the reconstruction of this tunnel was likely to take three or four months, a diversion round it was decided on to enable traffic working to be resumed whilst the work was still in progress.

The main feature of the diversion round Tunnel No. 5 was a great 250,000 cu. yd. fill, 132 ft. high with widths at formation and at the base of 50 ft. and 460 ft. respectively. A 6-ft. corrugated iron pipe culvert 480 ft. long was first

laid before the earthwork began. The earth was excavated from nearby cuttings and placed in 6-in. layers, by 50 diesel tractors and scrapers, which also consolidated the layers with water sprayed on them continuously to form a stable fill. This work was completed in 150 hr. by the contractor. As the diversion is shorter than the main alignment through the tunnel, it involved a 1 in 42 as compared with the normal ruling gradient of 1 in 45. Tunnel No. 6 was replaced by a cutting 140 ft. deep.

Some notes on the temporary diversion of traffic to the coast route and on the history of the inland route are embodied in an editorial this week.

Battery Tractor for Goods Depots

New unit at Lawley Street, L.M.R.



Loading a van from a Scott electric dray tractor at the Lawley Street, Birmingham, mechanised goods depot of the London Midland Region

THE first of a fleet of battery-operated electric dray tractors designed and built with the co-operation of British Railways by Scott Electric Vehicles Limited is now in service at the London Midland Region Lawley Street Depot, Birmingham. These three-wheeler vehicles will eventually replace the horses used for drawing internal drays at important railway goods depots all over the country.

The tractor is capable of hauling a payload of up to one ton. In use, it is simply backed under the front of a dray and a platform is elevated to lift the front axle 6 in. off the ground. The driver's seat is positioned at a height which enables him to walk on or off the dray without jumping down, thus saving both time and effort.

Controls consist of a steering wheel and brake, a three-step controller operat-

ing through a travel resistance wound on six formers, and a push-button ele-shaft driven.

The travel motor, rated at 2 h.p., with a chain drive to the split rim type front wheel, propels the tractor at a maximum speed of 4 m.p.h., loaded or unloaded, whilst the rear platform is raised hydraulically by a separate elevating motor, the necessary pump being shaft driven.

Tractor Equipment

Power for both motors of the tractor is drawn from a 24-volt D.P. Kathanode traction battery with a capacity of 184 Ah. at the 10-hr. rate. Solid 10 in. × 4 in. tyres are fitted at the rear and an 18 in. × 7 in. pneumatic on the front driving wheel.

The new Scott tractor is approximately 11 ft. long overall, and towing

a dray, has a turning circle of 24 ft. 6 in. Total weight, including the battery, is 1 ton 1 quarter.

MOBILE CRANES AND LOADING SHOVELS.—Thos. W. Ward Limited, Sheffield, and branches, has been appointed official general distributor of the Staffa mobile crane and Wetherill-Hydraulic loading shovels. The Staffa crane is constructed to lift 2-3 tons, and can be used with jib horizontal to lift 1½ tons. In this position the height is slightly over 10 ft., so that the crane can be used conveniently for unloading railway box wagons. The loading shovel has a sensitive control that enables it to load and stack bales, barrels, and other bulky items as well as shovelling and loading loose materials.

U.S. FREIGHT CAR PRODUCTION.—Assisted by an improved steel supply, freight car production in the U.S.A. continued to rise in December, Reuters reports. Deliveries aggregated 7,845 cars against 5,929 in November, according to the American Railway Car Institute and the Association of American Railroads. Deliveries for December, 1951, were 8,458. Freight cars ordered in December totalled 1,159, bringing the year's volume to 37,261. Orders still on hand on January 1, 1953, amounted to 80,296 cars against 87,657 a month earlier and 123,947 at the beginning of 1952.

CLOSING OF LUCKER STATION, N.E. REGION.—Investigations having shown that the services provided at Lucker Station are being maintained at a financial loss, the North-Eastern Region regrets to announce that it is necessary to withdraw the passenger train service and reduce the goods station to an unstaffed public freight siding on and from Monday, February 2. Alternative road services for passengers are available. Parcels and goods "smalls" will be conveyed by road collection and delivery service to and from Belford Station, and full load traffic requiring cartage will be diverted to that point. Non-carted full load traffic will be accommodated at Lucker operating as an unstaffed public freight siding, but staff will be provided to deal with livestock on receipt at Belford Station of an early notice that this service is required.

RAILWAY NEWS SECTION

PERSONAL

Sir Anthony Babington, Chairman of the Transport Tribunal in Northern Ireland, has had his period of office extended until December 31, 1954.

Lt.-Colonel E. R. Williams, M.B.E., Assistant General Agent for France, British Railways, has been elected Deputy Chairman of the Paris Branch of the British Legion, of which Viscount Norwich is Chairman. The branch has over 600 members.

At a meeting of the Traders' Co-ordinating Committee on Transport held on January 14, Mr. M. F. Barnard, M.Inst.T., was re-elected Chairman, and Mr. L. G. Burleigh, M.Inst.T., Vice-Chairman, for 1953.

Mr. William Archibald, M.I.Mech.E., M.I.Mar.E., Deputy Chief Engineer, Ulster Transport Authority, is relinquishing his appointment at the end of this month to take up consulting work in Sydney, Australia.

Mr. R. Jury, Chief Clerk to the European Freight Manager, Canadian Pacific Railway, has retired after 50 years' service.

Mr. L. E. Mitchell has been appointed Special Projects Engineer, Canadian National Railways, with assignment to duties relating to the St. Lawrence Seaway Project and other special undertakings.

The following appointments have been announced by the American Locomotive Company:—

Mr. Hunter Michaels has been appointed Vice-President-Operations for the company.

Mr. D. W. Cameron to Vice-President-Manufacturing.

Mr. Manuel Alonso was appointed Vice-President Foreign Sales.

Mr. Norman Paton, Assistant to the District Operating Superintendent (Eastern Operating Area), British Railways, Nottingham, who, as recorded in our January 23 issue has been appointed Assistant District Operating Superintendent (Eastern Operating Area), Manchester (London Road), began his railway career in 1934 as a clerk at Cowdenbeath on the former London & North Eastern Railway. In 1938, he was appointed a Traffic Apprentice. Mr. Paton joined the army in the Royal Engineers as a private in 1940 and was demobilised in 1946 with the rank of Lieutenant-Colonel. In 1945 he was awarded the M.B.E. Before his appointment at Nottingham, Mr. Paton was Deputy Chief of the Development Department of the Commercial Superintendent at Liverpool Street, London.

Mr. E. J. Skillings, Relief Stationmaster, Cambridge District Operating Superintendent's Office, Eastern Region, British Railways, has been appointed Stationmaster, Wolferton, in succession to Mr. R. B. L. Hodge.

Mr. B. H. Johnson, O.B.E., M.I.C.E., Chief Engineer, Rhodesia Railways, who, as recorded in our January 9 issue, has been appointed Assistant General Manager, was born in 1902 and educated at Brighton College and Clare College, Cambridge. He joined Rhodesia Railways in 1923 as Pupil Engineer and Junior Assistant Engineer. In 1926 he took up an appointment in India, but rejoined the Rhodesia Railways in 1927 as Assistant Engi-



Mr. B. H. Johnson
Appointed Assistant General Manager,
Rhodesia Railways

neer and was engaged on general railway work, including one year as Senior Assistant Engineer on the reconstruction of the main line between Wankie and the Victoria Falls. In 1936, on the introduction of 80 lb. rails, he was appointed Resident Engineer, Relaying, in charge of this programme, which involved the relaying of some 700 miles of the main line between Salisbury and Batoka. During the recent war he served with the South African Engineer Corps, Railway Construction & Maintenance Group, in Egypt, Palestine and in the Western Desert, rising to the rank of Major, and became second in command of the Group; he was mentioned in despatches for services in the Western Desert. Mr. Johnson returned to Rhodesia Railways in 1943, and was appointed District Engineer, Bulawayo, in 1946, and Assistant Chief Engineer in 1948. In 1951, Mr. Johnson was appointed Chief Engineer. He vacates this position to take up his new appointment of Assistant General Manager of the Rhodesia Railways.

Mr. A. J. Baker, Chief Mechanical Engineer, Southern Railway, India, who, as recorded in our December 19 issue, has come to England preparatory to retirement, relinquished his position on October 26 last. Mr. Baker joined the South Indian Railway as Planning Officer at the Golden Rock Workshops in 1931. From 1940 to 1945 his services were loaned to the Supply Department, Calcutta. During the period 1940-42, he was in charge of the Production & Maintenance Departments of the Ordnance Factory (Metal & Steel) at Ishapore, and from 1942 to 1945 he functioned as Director of Mechanical Engineering (General Directorate of the Supply Department). He returned in 1945 to the S.I.R. as Officer on Special Duty & Deputy Chief Mechanical Engineer (Workshops). In April, 1946, he was appointed Chief Mechanical Engineer, S.I.R. and confirmed with effect from January 1, 1947. On the amalgamation of the Madras & Southern Mahratta Railway, the Southern Indian Railway and the Mysore State Railways into the Southern Railway of the Indian State Railways, Mr. Baker became Chief Mechanical Engineer of the combined group, and was responsible for the arrangements necessary to integrate the working of the several mechanical departments.

Mr. L. Musgrave has retired as Assistant Port Goods Superintendent, Durban, South African Railways & Harbours.

Mr. H. R. Statham, who, as recorded in our January 23 issue, retired from the position of District Passenger Superintendent, Glasgow, Scottish Region, British Railways, on November 30, 1952, commenced his railway service in the Secretary's Office of the Great Central Railway at Manchester in 1908, and in 1910 qualified under that Company's scheme for higher-grade training in various departments, in which he was engaged during the next four years. During World War I Mr. Statham saw service with the Manchester Regiment, subsequently transferring to the Royal Engineers (Railway Operating Division), in which he attained the rank of Captain. After demobilisation he became Assistant Station Master, Manchester (London Road), in which post he remained until 1923, when he was appointed Assistant to the District Passenger Manager, Manchester, L.N.E.R. Six years later, Mr. Statham went south as Assistant London District Passenger Manager, and early in 1933 he became District Goods & Passenger Manager, Norwich. In 1944, he was appointed District Goods Manager at Leeds, and two years later became District Goods & Passenger Manager, Glasgow, L.N.E.R. Following the formation of the Scottish Region, Mr. Statham became District Commercial Superintendent (Passenger) Glasgow, which post was redesignated District Passenger Superintendent in March, 1950.

Mr. R. M. Smith, Chief Accounts Clerk, Parcels Office, Manchester Victoria, North Eastern Region, British Railways, has been appointed Passenger & Parcels Agent at Bradford, with effect from Monday, January 26.

Dr. A. W. C. Bennett, who, as recorded in our January 23 issue, retired from the service on December 31, has been Medical Officer to the former Great Western Railway and the Western Region of British Railways at Swindon for the past 23 years. He qualified M.R.C.S. and L.R.C.P. in 1916, and served in the R.A.M.C. during the 1914/18 War. His service with the former Great Western Railway commenced

training in various departments, became Senior Assistant to the Yardmaster, Wood Green, West Hartlepool, in 1928. He was promoted to Assistant Yardmaster, Bradford City Road in 1929, moved to London Spitalfields in a similar capacity in 1931, and made Assistant Yardmaster, Doncaster, in 1932. In 1936, he was promoted to Yardmaster at Leeds Marsh Lane. Four years later, he became Traffic Agent at Newcastle New Bridge Street, and, in 1942, was made Trains Assistant to the District Superintendent, Hull.

Mr. A. J. Ede, who, as recorded in our December 26 issue, has retired as Assistant General Manager of the New Zealand

We regret to record the death, on January 7, of Mr. R. L. Ray, formerly Chief Mechanical Engineer, East Indian Railway. Mr. Ray was 73.

Mr. H. J. Birkbeck, Principal Charges Officer, British Transport Commission, who, as recorded in our January 16 issue retired on December 31, 1952, after more than 47 years' service, joined the North Eastern Railway Company in May, 1905, and commenced work at Darlington in the building which previously had been the office of the old Stockton & Darlington Railway. After gaining experience at various stations in the area he was at York in the Chief Goods Manager's Office from December 1910 until



Dr. A. C. W. Bennett

Medical Officer, G.W.R. and Western Region,
British Railways 1929-1953



Mr. A. J. Ede

Assistant General Manager, New Zealand
Government Railways, 1952-53



Mr. H. J. Birkbeck

Principal Charges Officer, British Transport
Commission, 1950-52

in December, 1929. Dr. Bennett worked at the Swindon Medical Fund Hospital for a number of years as Assistant Surgeon and at the Victoria Hospital, Swindon, as Honorary Surgeon. On December 29 a luncheon was held in his honour at the Great Western Hotel, Swindon, when a presentation of a pair of binoculars was made by Mr. W. M. Pellow, Motive Power Superintendent, Western Region.

The following staff changes are announced by British Railways, London Midland Region:—

Mr. N. R. A. Paton, Assistant to District Operating Superintendent, Nottingham (Eastern Area) to be Assistant District Operating Superintendent, Manchester (Eastern Area).

Mr. C. E. Taylor, Goods Agent, Liverpool, Sandon Dock & North Mersey, to be Goods Agent, Liverpool, Huskisson.

Mr. C. E. Smith, Goods Agent, Oldham, to be Goods Agent, Manchester (Oldham Road).

Mr. A. G. Shinton, Railway Service Representative, Wolverhampton, to be Goods Agent, Albion.

Mr. G. C. Clark, Yardmaster, Hull, British Railways, North Eastern Region, has been appointed Assistant District Operating Superintendent, Hull. Mr. Clark, who joined the railway service at Leadenham (Lincs.) in 1920, was appointed a Traffic Apprentice in 1924, and, after

Government Railways, began his railway career in 1912 as a cadet in Wellington. In 1915 he left New Zealand to serve overseas with the Army. During the Second World War, from 1940 to 1943, Mr. Ede acted as Liaison Officer in the Wellington district between the Railways Department and the Armed Forces. Towards the end of 1943 he was appointed to the Transportation Superintendent's office as Liaison Officer responsible for the rail-borne movement of all New Zealand and American Armed Forces personnel. The efficiency with which Mr. Ede carried out his difficult wartime duties earned him special commendation from the Minister of Defence and Chiefs of the services. Appointed Transportation Superintendent in 1947, Mr. Ede later visited many overseas railways with several other New Zealand railway officers who investigated electrification systems and operating methods in the United States, Canada, Great Britain, Sweden and Switzerland. In August, 1952, he was promoted Assistant General Manager. Mr. Ede has been in the service for more than 40 years. On the eve of his retirement he was entertained by Mr. H. C. Lusty, the General Manager, and other executive officers.

Mr. S. G. Worth, Technical Assistant & Head of the Valuation Section at Paddington, Western Region, British Railways, has been appointed District Estate Surveyor, Cardiff.

1913, when he became the North Eastern Company's Commercial Representative at the Railway Exhibition at Ghent. In August, 1914, as a member of the Yeomanry, he was mobilised and served with the forces until his return to the Chief Goods Manager's Office at York in October, 1919. He was transferred in 1922 to the Superintendent's Office at Hull and, in April, 1923, following the amalgamation of the railways, to the Chief General Manager's Office of the London & North Eastern Railway at Kings Cross. In 1928 he joined the Goods Manager's Department at Kings Cross, and in 1933 was appointed Deputy Chief Rates Clerk. Three years later he was appointed District Goods & Passenger Manager, Peterborough District, where he remained until, in 1943, he was released for special duties with the Road/Rail Conference. In 1948 he became Assistant (Railway & General) to the Charges Adviser of the British Transport Commission, and, in 1950, Principal Charges Officer.

The British Transport Commission announces the following appointments:—

Mr. G. Dodson-Wells, M.B.E., Chief Public Relations Officer, London Transport Executive, as Commercial Advertisement Officer.

Mr. J. L. Perren, Assistant Commercial Advertisement Officer, as Deputy Commercial Advertisement Officer.

The British Transport Commission announces the following retirement and consequential appointments in its Legal Service:—

Mr. T. Hatto, Assistant Chief Solicitor, Conveyancing Division, Euston Station, N.W.1, to retire on February 20, 1953.

Mr. E. A. Boothroyd, Legal Adviser to the Docks & Inland Waterways Executive, to be Assistant Chief Solicitor of the Conveyancing Division, Euston Station, N.W.1.

Mr. J. Rigby, Assistant Solicitor, Litigation & Prosecutions Division, to be Legal Adviser to the Docks & Inland Waterways Executive, 22, Dorset Square, N.W.1.

Mr. J. D. Tattersall, Solicitor in charge of the York Office, to be Assistant Solicitor, Litigation & Prosecutions Division, Kings Cross Station, N.1.

Mr. B. H. Clegg, Senior Solicitor Assistant, Parliamentary & General Division, to be Acting Solicitor in charge of the York Office.

We regret to record the death on December 31 of Mr. J. B. Colwill, Assistant District Operating Superintendent, Swansea, Western Region, British Railways. Mr. Colwill joined the service of the former Great Western Railway in the Office of the Divisional Superintendent at Swansea in 1908, and occupied posts in various sections of the Office until appointed Chief Clerk in 1942. He became Assistant Divisional Superintendent in 1945, which post was re-designated Assistant District Operating Superintendent in 1950. The funeral, which was attended by many of his former colleagues, took place at Sketty Church on Saturday, January 3.

We regret to record the death, at the age of 58, of Mr. Francis Gardner, Midland Regional Sales Manager, Leyland Motors Limited.

We regret to record the death, on January 18, of Mr. Vernon Walker, Director of Leyland Motors Limited. Mr. Walker was 67.

Mr. J. W. Scott has retired as Chief Estimator, Head, Wrightson & Co. Ltd., after 66 years' service.

Mr. C. J. Stewart has been appointed Acting Manager of the Newcastle-upon-Tyne office of the Brush Electrical Engineering Co. Ltd., in succession to Mr. M. C. Blythe, who has become Sales Manager of Brush Electrical (Australia) Pty., Ltd.

We regret to record the death, on January 5, of Mr. Basil S. Cain, Assistant Manager of Locomotive Engineering, Locomotive & Car Equipment Department, General Electric Company (U.S.A.), who has been cited by the American Society of Mechanical Engineers as an outstanding authority on locomotives. Mr. Cain was 53.

The following appointments have been made by Metropolitan-Vickers Electrical Export Co. Ltd.:—

Mr. C. H. de Nordwall, M.I.E.E., Sales Manager, Industrial Control Department, to Manager for South America.

Mr. G. D. Harradine, Assoc.I.E.E., Assistant Sales Manager, Industrial Control Department, to Sales Manager.

Professor Willis Jackson, D.Sc., D.Phil., M.I.E.E., Professor of Electrical Engineering at the Imperial College of Science & Technology, University of London, to Director of Research & Education, as from July 1, 1953.

Mr. W. Cooling, A.M.I.Mech.E., has been appointed Chief Designer of Leyland Motors Limited, a position which has been in abeyance since Mr. N. Tattersall was appointed Acting Chief Engineer in 1950.

Mr. James Maxwell, General Manager of Thos. Cook & Son Ltd., left London by B.O.A.C. Comet on Tuesday, January 13, for a 7-week visit to Cook offices in Africa. He returns from Capetown by sea.

Mr. A. G. E. Briggs has relinquished his appointment as Deputy Controller of Supplies in the Ministry of Supply and has resumed his full-time duties as Joint Assistant Managing Director of Tube Investments Limited (Electrical Division).

Mr. R. B. Sims, B.Sc., A.M.I.Mech.E., A.Inst.P., has resigned as Head of the Rolling Laboratory, British Iron & Steel Research Association to take up the new post of Research Manager, Davy & United Engineering Co. Ltd., Sheffield.

The United Steel Companies, Limited, announces the following changes at the Steel, Peech & Tozer Branch, Rotherham:—Mr. V. Watkins, Maintenance Manager, to be appointed Deputy Chief Engineer; Mr. C. Wilkinson, Assistant Cold Rolling Mill Manager, to take up the appointment of Cold Rolling Mill Manager.

Metropolitan-Vickers Electrical Co. Ltd. announces the following appointments with effect from January 1, 1953:

Mr. H. W. Hardern, Assoc.M.C.T., M.I.E.E., to be Assistant Chief Engineer, Transformer Department.

Mr. E. L. N. Towle, B.Sc.(Eng.), M.I.E.E., M.I.Mech.E., M.I.Mar.E., to be Assistant Chief Engineer (Industrial), Electrical General Engineering Department.

Mr. F. B. Holt, A.M.I.E.E., to be Consultant (Industrial), Electrical General Engineering Department.

Mr. W. W. Weston, Sales Manager, Railway & Mechanical Departments, George Spencer, Moulton & Co. Ltd. has retired.

The following appointments have been made:—

Mr. N. W. Manby, Export Manager, Railway & Mechanical Departments.

Mr. A. J. Gibson, Manager, Railway Department.

Mr. G. Panzetta, Manager, Mechanical Department.

The Board of Directors of the American Institute of Mining & Metallurgical Engineers recently announced that the Robert W. Hunt award for 1953 will be given to Dr. J. H. Chesters, D.Sc.(Tech.), Ph.D., Assistant Director of Research, United Steel Companies, Limited, for his paper entitled "Flow Patterns in Open-Hearth Furnaces" presented at the 1951 Conference at Cleveland, Ohio, and subsequently published in the "Open-Hearth Proceedings."

Mr. E. L. Cadwallader, Director & General Manager, C.A.V. Limited, has relinquished his executive appointment but will remain on the board as Consulting Director. Mr. Hubert G. Mason, Director of Sales & Service, C.A.V. Limited, and a member of the board of Joseph Lucas (Export) Limited, has been appointed Joint General Manager. In addition to the wider responsibilities that his new appointment carries, Mr. Mason will continue to control the Sales & Service activities of the company.

Mr. Maurice Tattersfield, A.C.A., has been appointed Group Controller of Accounts, Brush A.B.O.E.

Mr. R. L. Packer has been appointed London Branch Manager, British Insulated Callender's Cables Ltd., in succession to Mr. F. Samuel, who is retiring on March 8, 1953.

Mr. G. W. Bone, Works Director of Davey, Paxman & Co. Ltd., Standard Ironworks, Colchester, was appointed Assistant Managing Director of that Company on January 1.

A luncheon has been given to Mr. C. W. V. Davis in celebration of his 25th anniversary at Sales Manager, Magnetic Filtration Section, Industrial Group, Philips Electrical Limited. Mr. S. G. P. de Lange presented Mr. Davis with a gold watch and cheque on behalf of the management.

International Conference on Pallets

Nine nations were represented by 34 delegates to the first international conference held in London in December to prepare standards for pallets for through transit of unit loads. In addition, seven observers attended as representatives of international bodies concerned with transport matters. The meeting was held under the auspices of the British Standards Institution, which holds the technical secretariat on this subject under the International Organisation for Standardisation (I.S.O.).

The British delegates were nominated from the B.S.I. committee, which includes representatives from the General Council of British Shipping, British Railways, British Road Services, National Association of Port Employers, National Road Transport Federation, Docks & Harbour Authorities Association, Docks & Inland Waterways Executive, Industrial Truck Manufacturers, British Industrial Pallets Association, and associations and firms concerned with handling large production by this method.

The increasing use of pallets for loading materials, particularly in international trade, makes the problem of agreed standards of dimensions one of paramount importance when it is realised that goods may be loaded and unloaded many times between works and the overseas customers; and indeed between works and buyer when both are in the same country.

It is therefore satisfactory to know that the conference reached agreement on several fundamental points. First, that there should be clear distinction between standards for international transport and national standards—the latter to cover conditions peculiar to each country and for pallets which would not be sent beyond the boundaries of a country. Secondly, two sizes only were fixed for pallets for international trade 40 in. × 48 in. and 32 in. × 48 in. Thirdly, overall sizes; the height between the pallet decks for free entry for the forks of the lifting truck; and the height above the ground of the upper deck, were decided so that these pallets were virtually completely standardised.

A fourth point on which agreement was reached related to the need to prepare an international standard for special pallets of larger size for sea transport, and a working group has been set up to consider this and other relevant matters.

Ministry of Transport Accident Report

Shawford, July 20, 1952: British Railways, Southern Region

Brigadier C. A. Langley, Inspecting Officer of Railways, Ministry of Transport, inquired into the accident which occurred at about 3.58 p.m. on July 20, 1952, at Shawford, near Winchester, when the 3.24 p.m. passenger train, Southampton Central to Waterloo, consisting of 7 coaches drawn by a 4-6-0 engine, overran the up local home signal at 30 m.p.h., passed through a sand drag over $\frac{1}{4}$ mile ahead and became derailed. The engine overturned down a 20 ft. embankment, followed by the tender and leading coaches which fortunately remained upright. There was no casualty among the 70 passengers or train crew. The driver had mistaken the signals, which were clear for a boat train on the up through line. This train was stopped by the guard of the derailed train who transferred his passengers to it. The local line was reopened for traffic at 6.24 the same evening. The engine was not recovered until 10 days later. It was fine and warm

the position until he saw too late the facing points set for the siding; he entered the sand drag at 20 to 25 m.p.h., remaining on the footplate when the engine overturned. His fireman was thrown out.

The driver was based on Nine Elms Motive Power Depot and seldom travelled over this route. He learnt it about 10 years ago and last April spent a few days as extra man on the footplate refreshing his memory, since when he had worked only one train over the line. He felt perfectly confident about his knowledge of gradients and signals, though "it did baffle him a bit" going up the local as he was used to going on the through line with a passenger train. He made no complaint about the signal aspects and his brakes were in good order. He frankly admitted his mistake and agreed he had been too hasty. He is 54, with 32 years' service, the last five as driver.

The fireman could add little to this evi-

temporarily obscured but he was much too hasty in jumping to the conclusion that an arm he saw to be "off" was for his own line. Weather could scarcely have been better and although smoke may have been hanging about a little, Brigadier Langley is confident that it could not have seriously affected the view had the driver been keeping a proper lookout. In any case, having seen only one signal he should have been prepared to stop and not have passed it until certain it referred to him.

The guard appears to have kept a good lookout and it is unfortunate that, having seen the local home signal at danger, he took no positive action when the train ran past. His view may have been temporarily obscured and he may have thought the driver had seen the signal clear for him. Had he continued to look out he ought to have seen the signal at danger when his van passed and should have had time to make an emergency brake application,

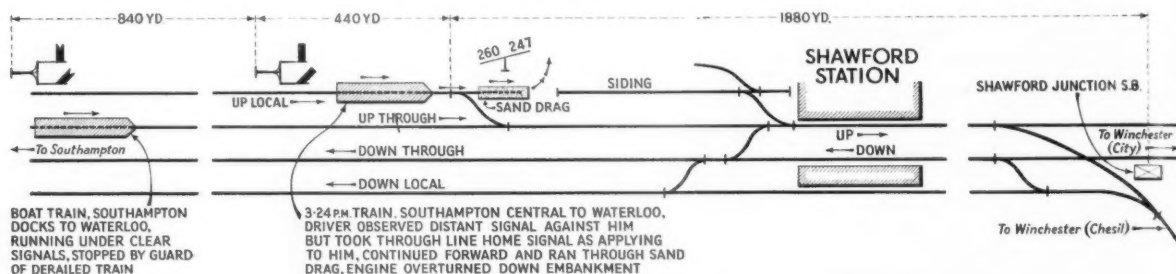


Diagram showing circumstances of the accident at Shawford, Southern Region, July 20, 1952

with a slight breeze. The accompanying diagram shows the lines, signals, etc., essential to an understanding of the case.

The view of the signals is good. The distances can be seen at 900 yd. and just after them the homes come into view at 800. They and the local-to-through cross-over points are worked electrically from Shawford Junction signalbox just over a mile beyond the points.

Evidence

The train from Southampton Central left Eastleigh to time, but was routed over the local line as the boat train, running late, had been accepted on the through. All signals were clear for both as far as Shawford, where the local signals were against the former, to give the boat train a clear run. The signalman at Shawford Junction had satisfied himself that his repeaters showed the local signals to be "on" when accepting, and all the equipment was found to be in proper order.

The driver of the passenger train said he saw the up through distant to be "off" and the local one "on" as he approached; he closed the regulator and shortly after made a partial brake application. His engine was making a lot of smoke, which obscured his vision so much when he shut off steam that at first he did not see the home signals ahead. He caught a glimpse of an arm in the "off" position about 100 yd. from it and accepted it as applying to the local line although unable to see the second one on the same post. Assuming wrongly that the line was clear, he opened the regulator and did not realise

the danger. The guard was in the fifth coach and observed the signals through his periscope. He saw the up local home to be at danger but the train did not slacken speed and he was about to operate the brake when the gauge dropped to 19 in. By this time the signal was hidden by smoke. The train did not stop and shortly he felt bumping and realised something unusual must have happened. He thought the driver must have seen the local home signal clear; not till his van passed it did he realise something was wrong. Running back he stopped the boat train.

An acting assistant guard was in the brake van of the leading coach and was looking back along the line. He thought both distances were at caution and he felt a slight brake application. The next thing he remembered was an emergency one, when the train was well past the home signal. He agreed that the engine was making a lot of black smoke.

The boat train driver caught a glimpse of the other train as he was approaching the Shawford distances; the through line arm only was at clear. He expected, on coming round the curve, to see the local line train standing at the home signals, but his fireman shouted there was a red flag ahead.

Inspecting Officer's Conclusion

Responsibility for this accident rests on the passenger train driver, who admitted his serious mistake. Although his experience of the route was slight, Brigadier Langley does not think he was confused by the signals, which stand out clearly. View of the home signals may have been

which could have stopped the train before the engine reached the overturning point even had speed been slightly greater than the driver's estimate of 30 m.p.h.; the engine still would have had 400 yd. to run to the end of the sand drag.

Remarks

Three months before the accident the driver spent seven days refreshing his memory of the route, after learning it 10 years previously, and should have been quite familiar with it, but he worked over it only twice in 24 weeks at intervals of 10 and 14. Although Brigadier Langley does not consider it a factor in this case he regards these periods as too long to give a driver sufficient opportunity to keep himself familiar with conditions. This particular Sunday duty has since been transferred to another link and Nine Elms drivers will normally work over the route not less than one week in five. Although it is practice in modern installations to site each signal, wherever possible, alongside the line to which it refers, there are quadruple track routes where arms for two parallel adjoining lines are placed on the same post. No objection can be taken to this arrangement, provided the signals stand out clearly and their indications are unmistakable, as they are at Shawford.

G.N.R.(I.) HALTS TO BE CLOSED.—The G.N.R.(I.) is to close two halts on the main line on March 1. They are Derrigahy and Broomhedge (Belfast-Lurgan line).

Electrical Equipment for Railways

Metrovick progress in 1952

During the early months of the past year the 3,000 h.p. gas-turbine locomotive No. 18100 built by the Metropolitan-Vickers Electrical Co. Ltd. for British Railways was subjected to an extensive series of tests, and early in April went into regular passenger service between London and Bristol, hauling the "Merchant Venturer" and "Bristolian" expresses. Subsequently transferred to the London-Plymouth and London-Swindon routes, involving a daily schedule of 600 miles, the locomotive has so far completed something like 60,000 miles of running.

Special runs have also been made with trains considerably heavier than those used in normal service—from London to Plymouth, Bristol and Wolverhampton. Much information has been obtained on this new form of railway motive power, not only from special test runs but also from experiments during normal passenger service. Several improvements have been made in minor features, and the performance of the locomotive has come up to every expectation.

The company has in hand 48 1,100-h.p. 76-ton diesel-electric locomotives for the Western Australian Government Railways, and some of the electrical equipments are installed; the mechanical parts are being built and the locomotives erected by Metropolitan-Vickers—Beyer, Peacock Limited, at Stockton-on-Tees.

Electrical equipments for 58 four-axle mixed-traffic locomotives for the Manchester—Sheffield—Wath electrification have now been completed (the mechanical parts are being built by British Railways), and 25 locomotives are in service on the section between Wath and Dunford Bridge. The first electrical equipments for seven six-axle locomotives are being installed.

Twenty-four 1,070-h.p. electric locomotives of the 50-tonne mixed traffic type have been completed (mechanical parts and erection at Stockton) for 3,000-V metre-gauge service in Brazil, 14 being for the Rêde Mineira de Viçação and 10 for the Rêde Viçação Parana—Santa Catarina. Ten 3,000-V 1,200-h.p. 68-ton shunting locomotives have been built for the South African Railways, and two similar locomotives for New Consolidated Goldfields.

Much work has been done on the electrical equipments for 40 1,500-V 3,800-h.p. locomotives for the New South Wales railways, and considerable deliveries have been made on other export orders.

Electrical equipments for 20 3,000-V motor coaches have been ordered by the South African Railways, and 52 similar equipments are in course of manufacture. There has been considerable activity in the field of flameproof battery locomotives for industrial use.

Train Lighting

Ten sets of motor-alternators with fluorescent lighting fittings and equipment have been delivered to the Netherlands Railways for use in steam-hauled stock, and trial installations of fluorescent lighting are being tested in India. Tungsten filament lighting equipment has been supplied to British Railways and the South African Railways.

Thirty-two sets of fluorescent lighting equipment are being supplied to the South African Railways for use in the Reef motor coaches, and 16 sets (with 44 sets of incandescent equipment) for Cape Western suburban coaches; the fluorescent lighting will be provided by continuous

runs of fittings with 2-ft. 20-W. lamps operating at 110-V. d.c.

Signalling Apparatus

Centralised traffic control equipment for the New Zealand Government Railways has now been completed. Several factory-wired relay racks and cabinets have been made for other contracts.

An order has been received for a complete signalling installation at Bridgeton

Cross, Glasgow, on the Scottish Region of British Railways. An outstanding number of stores orders has been received for signalling equipment for South Africa, India and Australia.

Among this year's developments has been a pulsating track-circuit equipment, which will make track circuits operable in conditions where the conventional equipment would not operate successfully; and an axle-counting device, which will provide a substitute for the track circuit where metal sleepers are used. A new design of rail brake is available for use in installations where the standard hydraulic pattern would be too large.

Western Region Holiday Camp Coaches

Accommodation at thirty inland and coastal sites available

The Western Region has been exhibiting to the public this week at Paddington, Bristol Temple Meads, Cardiff General and Birmingham Snow Hill Stations one of the holiday camp coaches, which will be available during the coming season at 30 sites on the Region.

Designed to provide sleeping accommodation for eight persons, the Western Region coaches have a spacious living room, kitchen equipped with cooker, cutlery and crockery, one 4-berth and two 2-berth sleeping compartments. Bedding and fresh linen are provided for each weekly tenancy. Paraffin for cooking, heating and lighting can be purchased from the stationmaster at the site.

Lettings are for a week or fortnight, beginning Saturdays, at the following weekly rates: Weeks April 4-May 16 inclusive and October 3-October 24 inclusive, £7; weeks May 23-June 27 inclusive and September 5-September 26 inclusive, £9; weeks July 4-August 29 inclusive, £10.

Short letting periods are available at Easter and Whitsun as follows: *Easter*, 2 p.m. Thursday, April 2 to noon Tuesday, April 7, £5. *Whitsun*, 2 p.m. Friday, May 22, to noon Tuesday, May 26, £5 5s.

Apart from the rental, the only condition is that each party must purchase a mini-

mum of six adult ordinary return tickets or their equivalent from their home station to the selected camp coach station.

The sidings in which the coaches are berthed are adjacent to the following station premises, with easy access to water and toilet facilities:—

Aberayron	Llanilar
Aberdovey	Llwyngwrl
Abererch	Loddiswell
Arthog	Lustleigh
Avonwick	Luxulyan
Blue Anchor	Manorbier
Borth	Marazion
Bow Street	Perranwell
Congresbury	St. Agnes
Dawlish Warren	St. Erch
Dolgellau	Stogumber
East Anstey	Symonds Yat
Fairbourn	Talsarnau
Ferryside	Wargrave
Fowey	Winscombe

BRYNMENYN-BLAENGARW SERVICE WITHDRAWN.—On February 9 the passenger service between Brynmelyn and Blaengarw (Glamorgan) will be withdrawn. Stations at Llangeinor, Pontycymmer, Pontyrhyll, and Blaengarw will be closed to passengers. A road motor service operated by the Western Welsh Omnibus Co. Ltd. serves the district. Blaengarw and Pontycymmer will still handle parcels.



Living room of Western Region camp coach

Contemporary Lighting Fittings

A display of lighting fittings in contemporary designs was held at the Mount Street, W.1, showrooms of Falk, Stadelmann & Co. Ltd. on January 22. Among those exhibited were two enclosed types which demonstrated how a fitting with all the practical advantages of designs now well established for lighting in commercial premises can embody contemporary taste in styling without appearing out of place in such surroundings. One of these fittings had a detachable louvre, while the other was totally enclosed, with a satin glass base to give maximum downward lighting without glare. In both styles the uniform flashing of opal glassware contributes to the appearance of the fittings when lighted. The enclosed pattern is being adopted in considerable numbers for lighting railway offices.

Other fittings at the display were of decorative styles suitable for places such as the larger town inquiry and reservation offices, where the railways emerge from their traditional architectural settings and their premises have to compete in attractiveness with showrooms and shops making use of every modern decorative device.

Loading Long-Welded Rails from Lineside Storage

A new method of loading long welded rails directly from the stacking ground on to wagons has been introduced on the Chicago, Rock Island & Pacific Railroad. The rails were welded at Silvis, Illinois, into 36 lengths, nearly all of them consisting of 40 132-lb. 39-ft. rails, or each 1,560 ft. in length, and were required for relaying about 70 miles away. After welding, they were laid out between and parallel to widely-spaced yard tracks on greased skids. A train made up of 21 flat wagons and eight gondolas was backed down the nearer track until its leading wagon was opposite the ends of the rails which were laid out square. On this wagon was a needle-eye roller guide, and the end of the nearest rail was picked up by a locomotive crane—working on the track beyond—and swung through an S curve into a position in which it could be threaded through the needle-eye by two men when the train backed a little farther. It was found that when the train was slowly backed the rail ran through the needle-eye and loaded itself on the first eight or nine wagons, the weight of the remaining portion of the rail on the ground providing sufficient anchorage to push the rail through the needle-eye.

At this point a halt was made and the crane again picked up the end of the rail and lifted it above the centre of the track and wagons so that it could be attached to a chain fastened to the overhead horizontal member of a portal frame previously erected astride the track. This frame was made of heavy bridge timbers reinforced with angle-irons and rails and securely strutted and tied with cables to resist the pull on the rail and chain when the train continued to back. This gave the rail a fixed anchorage enabling the rest of it to be loaded on the following trucks.

When this rail had been completely loaded, the train pulled ahead and the process was repeated so that 13 other rails were laid side by side on cross-timbers on the floors of the wagons. To facilitate this side-by-side loading, the chain attached to the frame could be moved transversely as

required. Subsequently a second layer of 14 rails was loaded over the first, the two layers being separated by wood strips; the remaining eight rail lengths were loaded as a third layer.

The work was completed by three labourers and the train and crane crews working under an assistant supervisor. It was found that the lateral reverse curve in each rail when being loaded from the skids tended to keep it from overturning. The only disadvantage of this method of loading was that excessive wear occurred in the rollers of the needle-eye, of which three sets were worn out and had to be replaced whilst loading the 36 rails. No doubt this defect has been or could be remedied in the light of this experience.

Parliamentary Notes

Gatwick Airport Extension

Mr. J. D. Profumo (Parliamentary Secretary to the Ministry of Civil Aviation) said in reply to a question on January 21 that his department had discussed with the Railway Executive the extension of Gatwick Airport, and particularly railway services between the airport and London and aircraft clearances over the railway. Various suggestions by the Railway Executive were under consideration.

One matter under discussion was the complete roofing in of the four railway tracks.

Freight Charges Increase

Mr. Alan Lennox-Boyd (Minister of Transport) was asked on January 26 to state the amount of the contributions to B.T.C. central charges expected from passenger traffic inside and outside the London Area at the time of authorising the freight charges increase effective from December 1, 1952, and as the result of the new Passenger Charges Scheme.

In authorising the freight charges, he said, he had accepted the advice of the Permanent Members of the Transport Tribunal acting as a consultative committee. It would have been improper for them to prejudice in any way any issue determinable by them as a Tribunal. The contribution by the various services to central charges was a matter for discussion before the Tribunal at the forthcoming hearing and he could not anticipate its findings.

Mr. Lennox-Boyd said he had been able to give this information on a previous occasion last June, because the Tribunal had then reported.

Mr. Ernest Davies (Enfield E.—Lab.) pointed out that hitherto London had been able to make a contribution to central charges but outside London receipts had not made any. In 1952, total increases in fares had been about the same as inside London whereas the quantity of traffic carried outside London was greater.

Passenger Fares

In answer to a question on January 26, Mr. Lennox-Boyd said that London would not be penalised by the new Passenger Charges Scheme. After outlining the various changes in main-line railway and London Transport fares since 1939, he pointed out that road passenger fares generally had risen throughout the country since the war.

The Government intervention last summer, he said, was directed to securing that in general the increases in sub-standard and concession fares were not proportionately greater than in ordinary fares. It was the result of the use that had been by the Commission of the

discretion that had been left to it by the Tribunal. Now they had better wait and see whether, this time, any discretion was left.

Mr. Eric Fletcher (Islington E.—Lab.) asked the Minister to ask the Prime Minister "to keep his eye on this matter" to avoid further injustice to the London travelling public.

Sir Herbert Williams (Croydon E.—C.) asked the Minister to inquire why privately-owned bus companies had raised their fares less than the publicly-owned companies.

Automatic Train Control

Mr. Lennox-Boyd said in answer to a question on January 26 on the extension and standardisation of A.T.C. and signalling on British Railways that he was awaiting the report of the Chief Inspecting Officer of Railways on the Harrow accident.

The B.T.C., he said, was giving urgent consideration, in the light of experiments which had been going on for some time, to the initiation of a practical programme for the extension of A.T.C. This question also would be fully reviewed in the Chief Inspecting Officer's report, and he could not say anything further at this stage.

He hoped that by the end of the month some 50 engines would be fitted with improved magnetic type signals and would be tried on the Barnet to Huntingdon line. But he did not want the public to think this would lead overnight to the fitting of it to all engines. There must be long and expert inquiries.

Mr. J. A. Sparks (Acton—Lab.) said that the G.W.R. system introduced 40 years ago had proved the most effective. It was impossible to achieve 100 per cent safety, and better to continue what had proved itself.

Mr. Lennox-Boyd said there must be experiments. With these production types there would probably have to be some six months of hard investigation. He hoped for definite achievement after that.

Mr. James Gallagher (Cardiff S.E.—Lab.) said that had it not been for the dissolution of the G.W.R. and the formation of the Railway Executive, the jealousy which had prevented the adoption of the system during the last 40 years would never have been got rid of.

Mr. Geoffrey Wilson (Truro—C.) asked what progress had been made with experimental use of radar for locomotives.

Steam Locomotive Maintenance

Answering a question on January 26 on faulty or negligent steam locomotive maintenance as a cause of accidents, Mr. Lennox-Boyd said that in 1951, 13 accidents reported were adjudged to be caused by faulty or negligent maintenance of locomotives. These included Weedon and Glasgow Queen Street. Final figures for 1952 were not available. Latest returns gave 13 such accidents, with 49 instances of injury and no fatalities. These included Blea Moor and Crewkerne.

There was, he added, no cause for alarm about conditions generally.

Mr. Ernest Davies thought that the starvation of the railways of capital investment had led to engines being kept in service though overdue for scrapping.

Mr. Geoffrey Wilson asked whether the altered regulations as to the reporting by drivers of defects were an improvement on the regulations under the old railway system.

Mr. Lennox-Boyd replied that there was an alteration in the basis of calculation in 1949. He would discuss that point with the Chief Inspecting Officer of Railways.

Contracts & Tenders

J. Stone & Co. (Deptford) Ltd. has received from the South African Railways an order for 1,200 Smith-Stone electrical speed indicator equipments for steam locomotives.

Cravens Railway Carriage & Wagon Co. Ltd. has received an order from the Rhodesia Railways for 20 bogie refrigerator vans, in addition to the 35 which it is now constructing. The vans are to be used particularly for traffic to and from the abattoir being built by the Colonial Development Corporation at Lobatsi.

The following contracts have been placed by British Railways, London Midland Region:—

Clarke & Son (Wigan) Ltd., Wigan, for labour only for the cleaning and painting of Liverpool Brunswick Goods Station.

Newtown Steelwork Co. Ltd., Burnley, for the renewal of the roof at Liverpool Park Lane cotton quay, with asbestos cement cavity roof decking.

Henry Hope & Sons Ltd., Smethwick, Birmingham, for the renewal of the roof coverings of the low roofs at Blackburn passenger station with patent glazing (Stage 2—Addendum Contract No. 2).

W. H. Heywood & Co. Ltd., Huddersfield, for patent roof glazing at Liverpool Huskisson Dock goods depot.

Edward Wood & Sons Ltd., Derby, for a new hair carding room, seat, storage and laundry, and repairs and alterations to existing trimming shop buildings at Derby Carriage & Wagon works.

Robertson Building Service (H. H. Robertson Company), Ellesmere Port, for the renewal of roof coverings with protective metal sheeting and provision of scaffolding, safety sheets, etc., at Liverpool Park Lane cotton quay.

Redpath, Brown & Co. Ltd., Trafford Park, Manchester, 17, for the supply and delivery of steelwork for the renewal of roofs at Lostock Hall and Walsall motive power depot engine sheds.

Johnson Bros. (Aylesford) Ltd., Vale Road, Tonbridge, for the resurfacing of the footpaths at Toton down yard with tar macadam.

British Railways, Western Region, announce that the following contracts have been placed:—

Hydraulic Engineering Co. Ltd., Chester. Supply of three electrically-driven hydraulic pumps for the central hydraulic power station at Swindon. Working pressure, 800 lb. per sq. in.

Henry Berry & Co. Ltd., Leeds, 10. Supply of three electrically-driven hydraulic pumps for the central hydraulic power station at Swindon. Working pressure, 1,500 lb. per sq. in.

Industrial Engineering Limited, London, W.1. Treatment of the corrugated iron roofs of the central boiler station, rolling mills, die sinking shop, stamping shop and electrical stores, locomotive works, Swindon.

Lucas Furnaces Limited, Birmingham, 7. Conversion of a Lucas forced draught plate furnace in the "V" Shop, Locomotive Works, Swindon.

Automatic Telephone & Electric Co. Ltd., London, W.C.2. Provision and installation of additional extension line equipment, etc., on Bristol Temple Meads Exchange.

The Cement-Gun Co. Ltd., Brentford. Carrying out repairs to Cherry Orchard road bridge, Llanishen (Glam.).

Hunting Aerosurveys Limited, Boreham Wood, Herts. Carrying out an aerial survey, etc., from Barnstaple Junction to Halwill Junction.

Adlon Erectors Limited, London, S.W.20. Carrying out repairs to roofs and the provision of new smoke chutes at the motive power depot, Slough.

Penarth Pontoon, Slipway & Ship Repairing Co. Ltd., Penarth Docks. Work to be performed in connection with the annual overhaul of ss. *St. Patrick*, 1953.

W. & J. Glossop Limited, Bridgend. Resurfacing the down main platform at Gloucester Eastgate passenger station.

The Board of Trade, Commercial Relations & Exports Department, has been approached by the General Supply Company, S.A., of Mexico, which wishes to come to agency agreements with United Kingdom manufacturers of port machinery and heavy marine equipment such as floating dredges, stationary and floating cranes, and pontoons up to 1,000 tons capacity, railway coaches of the de luxe and ordinary types, freight vehicles, diesel locomotives and diesel-powered lightweight trains.

The General Supply Company S.A., founded in 1907, is known to hold United Kingdom agencies for machinery, machine tools and hardware, and also represents United States firms. United Kingdom manufacturers interested in this inquiry should write to the President & Managing Director of the company—Mr. Alfred Rudich, the General Supply Company, S.A., Vallarta 1 (Apartado Postal 1433), Mexico, D.F.—giving full particulars of their products.

The Special Register Information Service of the Board of Trade reports that the United Kingdom Trade Commissioner at Delhi has notified the Commercial Relations & Exports Department of a call for tenders issued by the Directorate General of Supplies & Disposals, Government of India, for:—

2 65-ft. turntables, m.g., to Railway Board's drawings, Nos. 1.R.S./M/8015/alt. 3 to 8024, as per specification.

Tenders should reach the Director General of Supplies & Disposals, New Delhi, by 11.30 a.m. on February 16. A copy of the tender documents is available for inspection at the Board of Trade by representatives of United Kingdom manufacturers until February 2, after which date it will be available on loan in order of written application. Reference CRE/3131/53 should be quoted.

The Special Register Information Service of the Board of Trade, Commercial Relations & Exports Department, reports that the United Kingdom Trade Commissioner at Delhi has notified a call for tenders issued by the Directorate General of Supplies & Disposals, Government of India, for the supply of:—

12 cross heads, O.T. type, for "G" "H," "M" and "P" locomotives.

6 r.h. and 6 l.h. cross head assemblies for "WP" locomotives.

Tenders should reach the office of the Director General of Supplies & Disposals, New Delhi, by 10 a.m. on February 16. A copy of the tender documents is available for inspection at the Board of Trade by representatives of interested United Kingdom manufacturers. A further copy is available on loan in order of written application. Reference CRE/3114/53 should be quoted.

The Special Register Information Service of the Board of Trade states that the

United Kingdom Trade Commissioner at Delhi has reported a call for tenders, issued by the Director General of Supplies & Disposals, for the supply and delivery of:—

60 magnetic-lighting switches similar to J. Stone "DD" lighting switch; 50 dynamos, shunt wound 100 amp. 24/32 V., complete with cut-in and cut-out switch, lamp resistance, motoring terminal, output adjuster, over-voltage relay, belt tensioning gear; 8 dynamos, shunt wound, 45 amp., 24/32 V., complete with cut-in and cut-out switch, lamp resistance, motoring terminal, output adjuster, tensioning spring tensioning rod, hand wheel pulley; 31 battery change-over switches similar to J. Stone Pegoud switch.

The closing date for the receipt of tenders is 10 a.m. on February 18, and tenders should be addressed to the Director General of Supplies & Disposals, Shah-jahan Road, New Delhi. A copy of the specifications and tender documents is available for inspection by representatives of United Kingdom manufacturers at the Commercial Relations & Exports Department, Board of Trade. A further copy is available on loan in order of written application. Reference CRE/3132/53 should be quoted.

Notes and News

Mechanical Engineer Required.—Applications are invited for the post of mechanical engineer required by a firm of engineers in Sheffield. See Official Notices on page 139.

Vacancy for Locomotive Engineer.—Applications are invited for the post of locomotive engineer required by the Steel Company of Wales Limited, Port Talbot, to take charge of maintenance of an expanding fleet of 15 diesel-electric locomotives. See Official Notices on page 139.

Institute of Transport Informal Luncheon.—On February 24 the Institute of Transport will hold an informal luncheon at the Connaught Rooms, Great Queen Street, W.C.2, at 12.30 p.m. for 1 p.m. The address at this luncheon will be given by Mr. Harold Watkinson, M.P., Parliamentary Secretary, Ministry of Labour.

Objection to London Fares Increase.—Some 20 M.P.s. representing constituencies in the London Area were reported earlier this week to have agreed a motion relating to the Passenger Charges Scheme, 1953, to be moved in the House of Commons. The motion calls for "a searching and impartial inquiry into the whole administration and operation of the London Transport system."

Punctuality of Liverpool Street Services.—Despite adverse weather nearly 90 per cent of all Eastern Region steam trains using Liverpool Street Station during the week ended January 17, in the busy morning and evening periods, arrived either right time or not more than 5 min. late. The figures show an improvement on last year, when weather was less severe. Electric services were even better—93 per cent right time in the up direction and 85 per cent in the down. Including those only a few minutes late, the figure rose to 99 per cent in each case.

East Indian Railway Annuities.—At the half-yearly meeting of the East Indian Railway Company on January 21, the Chairman, Sir William P. Elderton, out-

lined in the course of his address the position regarding payments of annuities. He said that since the end of the half-year Stock Exchange securities had been sold and the proceeds reinvested in Treasury bills maturing at the date when it was expected that they would be ready to pay out the sinking funds. They hoped to be ready to pay annuities very early in March and while some delay might be inevitable they saw no reason why the whole settlement should extend beyond the beginning of May.

Institution of Railway Signal Engineers.—On February 18 at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2, at 6 p.m., a paper will be read by Mr. L. J. M. Knotts, Railway Executive, before the Institution of Railway Signal Engineers on "Power Signalling Equipment. Design and Performance related to Installation and Maintenance."

Institution of Locomotive Engineers.—At the Institution of Mechanical Engineers, Storey's Gate, S.W.1, on February 18 at 5.30 p.m. a paper will be read before the Institution of Locomotive Engineers on "Operating Experiences with Two Gas Turbine Locomotives" by Mr. A. W. J. Dymond, Assistant to Mechanical & Electrical Engineer, Western Region, Swindon.

Aerial Photographic Survey of Railways.—The Western Region is using aerial photography to obtain information in plan form on sections of railway track and layout. The great progress made in recent years in the method of photogrammetric mapping through camera development and the increased efficiency of precision instruments used for plotting the information obtained by aerial photography, enables plans to be produced with great accuracy up to 40 ft. to the inch. The Western Region has made considerable use of this method of survey; the latest instance is the Barnstaple Junction to Halwill Junction line, which is being carried out by Hunting Aerosurveys Limited.

Directional Sign at Euston.—A method of combining several direction indications, such as may be necessary at large stations, is shown in the accompanying illustration of a new sign erected recently at Euston Station, L.M.R. It is suspended over the Drummond Street entrance to the station.

adjacent to the train arrival bureau, and together with several others at strategic points elsewhere in the terminus, has been designed by Mr. George Dow, Public Relations & Publicity Officer, London Midland Region. The sign, which is double-sided and of vitreous enamel, was made by Mead, McLean & Co. Ltd. It is finished in Regional colours, the white Gill sans letters being on a maroon background.

Iron & Steel Bill Debate.—The House of Commons was due to begin the Committee Stage of the Iron & Steel Bill on January 28, with continuation of the debate yesterday (Thursday) and next week.

New Line in Travancore—Cochin.—The two tunnels on the new line of the Southern Railway of India under construction between Ernakulam and Quilon will aggregate 1,000 ft. in length, and not 100 ft. as stated in our January 16 issue.

Catering on B.E.A. Tourist Flights.—It is intended to maintain the existing catering services in B.E.A. aircraft when the new tourist fares, referred to in our editorial last week, are introduced. On shorter flights refreshments, such as sandwiches and beverages, are served without extra charge, while on the longer journeys a meal, comprising courses such as cold meat and salad, is included in the fare. Inclusive fares covering refreshments or meals are also in operation on the Anglo-Scottish routes of the Corporation.

Permanent Way Institution Winter Meeting.—Mr. F. Q. den Hollander, President of the Netherlands Railways, will give a talk on "Organisation and Recent Developments on the Netherlands Railways" at the end of the business of the 69th annual winter meeting of the Permanent Way Institution at the Institution of Civil Engineers tomorrow, January 31. This year a conversation will be held at the Railway Executive Headquarters after the meeting in place of the customary winter dinner.

S.G.E. Dramatic Society.—On January 22, 23, and 24, the Siemens and General Electric Railway Signal Co. Ltd. Diamond Players presented "Little Lambs Eat Ivy," a comedy in three acts by Noel Langley, at the Hirst Hall, G.E.C. Estate, Wembley. The production, under E. Graham

Henderson, was of a high standard, the sense of comedy being well sustained by the cast. Features included the entire absence of prompting, and excellent decor, for which the producer is to be congratulated. The Diamond Players' next production will be "Progress to Fotheringhay" by T. B. Morris, at the Fortune Theatre, Drury Lane, during the G.E.C. Coronation Year Drama Festival, on April 30, May 1 and 2.

Institution of Electrical Engineers.—At the Institution of Electrical Engineers, Savoy Place, London, W.C.2, on February 9, at 5.30 p.m., there will be a discussion, to be opened by Mr. W. Bamford, on "Is Technical Advertising Necessary or Desirable."

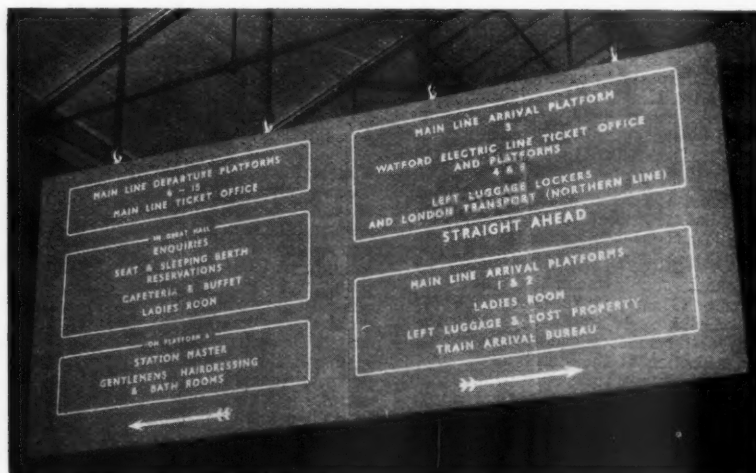
Institute of Transport Annual Dinner.—At the annual dinner of the Institute of Transport, to be held on March 20 at the Connaught Rooms, Great Queen Street, London, W.C.2, at 7.0 for 7.30 p.m., the Rt. Hon. Sir David Maxwell Fyfe, Home Secretary, and the Rt. Hon. Hugh Gaitskell have accepted invitations to speak.

Weekend Coal Traffic on British Railways.—The biggest weekend clearance of deep-mined and open-cast coal for eleven months (418,010 tons) was accomplished by British Railways during the 48 hr. ended 6 a.m. on January 26. The week's total was 3,306,840 tons. During the week ended January 17, the tonnage of iron and steel conveyed from the principal steelworks was the heaviest for two months (225,636 tons), and 298,500 tons of iron ore were carried.

L.M.R. Boxing Championship Entries.—Eighty-four entries have been received for the British Railways (London Midland Region) Boxing Championships to be held at Horwich on February 6 and at Crewe on February 21. Winners of the contest in ten recognised weights will be London Midland champions for 1953 and will go forward to the quarter finals of the inter-regional tournament and, if successful there, will contest for the All-Railway Championship at the Albert Hall on April 17.

Tourist Guide to British Hotels.—The British Travel & Holidays Association has published the second edition of its new-style guide to hotels in the British Isles. First issued last year, the guide is intended primarily for the benefit of visitors from overseas but a limited number of copies will be sold in this country, priced at 2s. 6d. Copies are obtainable from the Association at 64-65, St. James's Street, London, S.W.1. The new edition contains details of more than 4,000 hotels—a considerable increase compared with the 1952 version. There are several new features including sectional maps covering the entire country. The index is keyed to popular tourist areas. Continuing the practice established with the first edition, no attempt has been made at "grading" but facilities offered by hotels are indicated in sufficient detail to allow visitors to make their own assessment. For the convenience of tourists, hotels within a radius of 25 miles of the capital are grouped in an "Around London" section. There is also a list of London restaurants which indicates specialities of cuisine.

Grand National Excursions from N.E. Region.—Four excursions, one each from Newcastle, York, Bridlington, and Bradford, are proposed by the North Eastern



Multiple direction sign in L.M.R. colours at Euston

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is exempted from the provisions of the Notification of Vacancies Order, 1952.

REQUIRED by the Central Railway of Peru two Locomotive Assistants preferably single and between 26/30. Qualifications: Full apprenticeship with British Railways or Locomotive Builders and experience in one or more of the following: Railway Machine Tool Operation, Welding, Boiler work, Locomotive Running or Drawing Office. Apply—Secretary, PERUVIAN CORPORATION LTD., 144, Leadenhall Street, London, E.C.3.

THE "PAGET" LOCOMOTIVE. Hitherto unpublished details of Sir Cecil Paget's heroic experiments. Eight single-acting cylinders with rotary valves. An application of the principles of the Willans central-valve engine to the steam locomotive. By James Clayton, M.B.E., M.I.Mech.E. Reprinted from *The Railway Gazette*, November 2, 1945. Price 2s. Post free 2s. 3d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

LOCOMOTIVE ENGINEER required by The Steel Company of Wales Limited, Port Talbot, to take charge of maintenance of an expanding fleet of 15 Diesel-Electric Locomotives. Applicants should have a thorough knowledge of Diesel-Electric traction, from the standpoint of both major overhauls, running maintenance and servicing and preferably possess a degree or equivalent qualifications in Mechanical or Electrical engineering. A good knowledge of steam locomotives would be a considerable advantage, though not essential. Applications in own handwriting, giving age, qualifications, experience, etc., should be addressed to:—THE PERSONNEL SUPERINTENDENT, P.O. Box No. 3, Port Talbot, Glam.

RAILWAY MAINTENANCE PROBLEMS. By H. A. Hull (late District Engineer, L.M.S.R.). Valuable information. With much sound advice upon the upkeep of permanent way. Cloth. 94 in. by 54 in. 82 pp. Diagrams. 5s. By post 5s. 3d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press Limited, 33, Tothill Street, London, S.W.1.

SMALL family firm of light Engineers in Sheffield require first class Mechanical Engineer—to take charge, in first instance, of methods and tooling. Must be practical and progressive. Position carries prospect of seat on Board. Write, stating experience, qualifications, age and salary required, to Box 723, *The Railway Gazette*, 33 Tothill Street, London, S.W.1.

TRANSPORT ADMINISTRATION IN TROPICAL DEPENDENCIES. By George V. O. Bulkeley, C.B.E., M.I.Mech.E. With chapters on Finance, Accounting and Statistical Methods. In collaboration with Ernest J. Smith, F.C.I.S., formerly Chief Accountant, Nigerian Government Railway. 190 pages Medium 8vo. Full cloth. Price 20s. By post 20s. 6d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

WANTED—1,000 tons relayable B.H. rails 95 lbs. B.S.S. Offers to—EAGRE CONSTRUCTION Co., Ltd., East Common Lane, Scunthorpe.

N.E.R. HISTORY.—Twenty-Five Years of the North Eastern Railway, 1898-1922. By R. Bell, C.B.E., Assistant General Manager, N.E.R. and L.N.E.R. Companies, 1922-1943. Full cloth. Cr. 8vo. 87 pages. 10s. 6d.—*The Railway Gazette*, 33, Tothill Street, London, S.W.1.

Region in connection with the Grand National on April 5, providing both first and third class accommodation. On three of these trains dining car stock will be provided and arrangements made to supply breakfast, lunch, afternoon tea, and dinner en route.

Golden Valley Line to Close.—The Western Region announces that freight services over the Abbeydore and Dorstone branch will be withdrawn on February 2, and Bacton, Vowchurch, Peterchurch, and Dorstone stations will be closed. Parcels traffic will be accepted at Abbeydore or Hay, where goods traffic in full wagon loads will also be dealt with. Existing road motor C. & D. services for parcels and smalls will be maintained as hitherto. Passenger services over the Golden Valley line were withdrawn in 1941.

Manchester Exchange Station to be Renovated.—Work is to begin very soon on renovations to Manchester Exchange Station (London Midland Region). The main improvements include new station frontages, a covered booking office, a new inquiry office, and better entrance concourse arrangements. Lavatories are to be modernised and staff facilities improved; and the station will be painted and tidied up. At the same time the signs and advertising display are to be modernised throughout. Efforts are being made to have the work completed in time for the Coronation.

New Air Services Approved.—Amongst new air services approved by the Minister of Civil Aviation, Mr. Alan Lennox-Boyd, are those of Airlines (Jersey) Limited from April 1 next on the routes Gatwick to Southampton (optional) to Alderney to Guernsey and/or Jersey to St. Brieuc to Lannion to Brest; Manchester to Coventry and/or Bournemouth to Guernsey and/or Jersey to Dinard to Rennes to La Baule; and Exeter to Guernsey and/or Jersey to Caen to Paris. Other services authorised are those of Morton Air Services Limited and Olley Air Services Limited between Croydon and the Channel Islands; and of East Anglian Flying Services Limited on the route Ipswich - Southend - Rochester - Shoreham - Jersey from April 1 next.

Highbury & Islington Station to be Renovated.—Authority has now been obtained for the partial reconstruction of Highbury & Islington Station on the L.M.R. North

London line. Work is expected to start next May or June; it includes the repair and decoration of the station front and booking hall, reconstruction of the overbridge, and improvement of accommodation on both platforms. The modernisation of signs will be completed and the advertising display improved. Other stations already renovated in the improvement scheme for the North London line are Broad Street, Finchley Road & Frognaal, West End Lane, Brondesbury, Kensal Rise, and Acton Central; and similar work is at present in hand at Camden Road. The platforms at Hampstead Heath have been reconstructed, and complete rebuilding of Gospel Oak is in progress.

Annual Dinner of Berks, Bucks & Oxon Section, Institute of Transport.—The annual dinner of the Berks, Bucks & Oxon Section of the Institute of Transport took place on January 26 at the George Hotel, Reading. The President, Mr. C. T. Brunner, responded to the toast "The Insti-

tute" proposed by Mr. G. F. Darlow, Town Clerk of the Borough of Reading. Other toasts were "The County Borough of Reading" proposed by Mr. H. Weedy, General Manager, City of Oxford Motor Services Limited, to which the response was made by the Mayor of Reading, Councillor F. W. Lewis. Mr. A. E. Flaxman, District Goods Superintendent, British Railways, Reading, proposed the toast "Our Guests," which was responded to by Mr. W. F. Herbert, Director of Education, Berkshire. Finally, the toast of "The Chairman" was made by Mr. L. H. Balls, immediate Past-Chairman, and General Manager of the Thames Valley Traction Co. Ltd., and this was responded to by Mr. Norman S. Taylor, who presided over the gathering.

Plan of Transport Units.—Steps to prepare a plan showing the size, character, and location of transport units likely to be of the greatest service to users are being taken by the Western Area of the Road

Visitor from Burma Railways at Toton



Mr. C. D. E. Stephenson (left), District Traffic Superintendent, Burma Railways, with Mr. W. D. Lander, the Yard Master, in the control tower at Toton Up Yard while visiting this country on a United Nations Fellowship in Railway Operating

Haulage Association after a meeting in Bristol on January 23, at which the Association's Chief Executive Officer, Mr. R. Morton Mitchell, addressed 60 members and ex-members. The Area Chairman, Captain G. A. P. Upston, presided. Prospective buyers of transport units are being invited to indicate what units they consider should be set up. The information should be of great assistance to the disposal board, before a final decision is taken on the size and nature of the units to be offered for sale.

Welding Design Courses.—Courses on "Design of Welded Structures," organised by the Quasi-Arc Co. Ltd., are now held in London, Bilston, and Newcastle. The next course will be held in London at the Institute of Marine Engineers. Minorities, beginning on February 3. Lectures will be given from 4.30-6 p.m. on Tuesday and Thursday evenings over a period of seven weeks. Further details, and enrolment forms, can be obtained on application to The Constructional Design Department, the Quasi-Arc Co. Ltd., Bilston, Staffs.

Forthcoming Meetings

- February 2 (Mon.).—Society of Engineers, in the Apartments of the Geological Society, Burlington House, W.1, at 5.30 p.m. Presidential Address.
- February 2 (Mon.).—Institute of Transport, at 80, Portland Place, W.1, at 5.30 p.m. for 6 p.m. Symposium on British Railways—"Commercial," by Mr. A. E. Hammett, and "Operating," by Mr. S. W. Smart.
- February 2 (Mon.).—Historical Model Railway Society, at the Headquarters of the Stephenson Locomotive Society, 32, Russell Road, W.14, at 7.0 p.m. Paper on "The Railway Cross-Channel Services," by Mr. C. Grasemann.
- February 3 (Tue.).—Permanent Way Institutions, Leeds Section, at Leeds Church Institute, Albion Place, at 7.0 p.m. Paper on "Bridgework as it Affects the District Engineer and his Staff," by Mr. A. N. Butland.
- February 4 (Wed.).—British Railways, Southern Region Lecture & Debating Society, in the Chapter House, St. Thomas' Street, S.E.1, at 5.45 p.m. for 6.0 p.m. "If you want to know . . . Ask a policeman," by Colonel N. McK. Jesper.
- February 5 (Thu.).—Society of Chemical Industry, Nottingham Section, in the Gas Showrooms, Parliament Street, Nottingham, at 7.15 p.m. Paper on "The Effect of Climate and Atmospheric Pollution on Corrosion," by Mr. J. C. Hudson and Mr. J. F. Stanners.
- February 5 (Thu.).—British Railways, Western Region, London Lecture & Debating Society, in the Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.1, at 5.45 p.m. "That there is a case for State Subsidisation of British Railways," a debate with the Railway Students' Association.
- February 5 (Thu.).—Railway Students' Association, in the Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.1, at 5.45 p.m. Debate with the Western Region London Lecture & Debating Society on "That there is a case for the State Subsidisation of British Railways."
- February 5 (Thu.).—Electric Railway

Society, at the Fred Tallant Hall, 153, Drummond Street, N.W.1, at 7.15 p.m. Paper on "The Swiss Federal Railways," by Mr. C. Smith.

February 5 (Thu.).—Institution of Electrical Engineers, Savoy Place, W.C.2, at 5.30 p.m. Paper on "The First Stage of the Electrification of the Estrada de Ferro Santos a Jundiá (late São Paulo Railway)," by Mr. R. J. B. Chatterton and Mr. D. H. Rooney.

February 6 (Fri.).—The Railway Club, at 57, Fetter Lane, E.C.4, at 7.0 p.m. Annual General Meeting, followed by a paper "The Eastern and Midlands Railway (1882-1893)," by Mr. Kenneth Brown, President.

February 6 (Fri.).—Locomotive Society of Scotland, at 302, Buchanan Street, Glasgow, C2, at 7.15 for 7.30 p.m. Paper on "Locomotive Lubrication," by Mr. James Cunningham.

February 9 (Mon.).—The Institute of Transport in the Jarvis Hall, 66, Port-

land Place, W.1, at 5.45 p.m. Branker Memorial Lecture: "The Influence of Military Aviation on Civil Air Transport," by Sir Frederick Handley Page, past President.

February 9 (Mon.).—Locomotive & Carriage Institution of Great Britain & Eire, Doncaster Centre, at 6.30 p.m., at the Doncaster Plant Works Library, British Railways, Eastern Region; Paper on "Locomotive Valve Gears," by Mr. E. Windle.

February 9 (Mon.).—Institution of Electrical Engineers, at Savoy Place, London, W.C.2, at 5.30 p.m.; Discussion on "Is Technical Advertising Necessary or Desirable?" opened by Mr. W. Bamford.

February 9 (Mon.).—Railway Service Christian Union Meeting, in the Clerical Dining Hall, London Midland Region, Cardington Street, Euston, N.W.1, at 6.15 p.m. Speaker, Mr. D. W. M. Fox.

Railway Stock Market

The main interest in stock markets has attached to Industrial shares and British Funds. Foreign rails therefore have been relatively quiet, though with minor features of interest. There has been a fair amount of selective buying of foreign rails by investors prepared to take a longish view. This is because of the possibility of take-over offers, which, it is calculated, would have to be well above the current level of market prices of the ordinary or equity stocks. The current prices of the latter and also of industrial shares are generally well below their break-up value based on the present day replacement value of assets. This has been illustrated by the many take-over bids which have been a feature of the industrial sections of markets in recent weeks. In cases where bids of this kind have gone through they are invariably on a basis well in excess of the current market prices of shares which is governed in the main by the dividend paid. It is being asked in the City whether recent developments will mean a tendency for the break-up value or the value of a company's assets to have a bigger influence in future on the market price of shares.

White Pass & Yukon common shares have remained active, and at \$20½ have held best levels, while the 5 per cent convertible debentures were favoured around £74. Antofagasta ordinary and preference have been firmer at 10½ and 50½ respectively.

United of Havana stocks were quiet in the absence of any news of take-over developments from Cuba. The 4 per cent "A" stock was 61, the 4 per cent "B" 56½, the second income stock 17½ and the consolidated stock 2½.

Canadian Pacifics receded to \$58, but at the time of writing the preference stock has strengthened to £63½ and the 4 per cent debentures to £78½. Algoma Central & Hudson's Bay 5 per cent income debentures have been dealt in at close on \$249.

Taltal shares were 15s. 6d. and Nitrate Rails 20s. 6d., while São Paulo 6s. 8d. units have changed hands around 7s. 6d. Manila Railway issues continued quiet, though buyers were about on any reaction. The "A" debentures were 80, the preference shares 9s. and the ordinary 1s. shares 3s. 6d.

Elsewhere, Paraguay Central 6 per cent debentures came back to 15 and the 7 per

cent "A" debentures to 12. Costa Rica first debentures were dealt in up to 59, Chilian Northern 5 per cent first debentures have changed hands at 27, and Guayaquil & Quito 5 per cent bonds up to 37.

Barsi Light Railway stock remained active with business around 117½ at the time of going to press.

There has been further speculative buying of old Russian railway bonds, among which Black Sea Kuban marked 3s. 9d. and Troitzk 6s. 3d. The signs of some speculative buying of Russian bonds is the result of talk that pre-1917 Russian assets in the U.K. might be sold and distributed to creditors and bondholders. On the other hand there would probably be very little for bondholders, and the danger of Russian bonds is that in the future it might be very difficult to find a buyer.

Among road transport shares West Riding eased to 37s. 6d., but Southdown have been firmer at 29s. 9d. and Lancashire Transport 42s. Trent Motor Traction marked 29s. 9d. Elsewhere, B.E.T. deferred stock at £455 failed to hold best levels.

There has again been rather more activity among engineering and kindred shares, though Guest Keen have eased to 49s. 10½d. At one time last week they fell back to 48s. 9d., but later, buyers were attracted by the good yield and by general confidence that the 15 per cent dividend will be maintained. T. W. Ward held their rise to 74s., but at the time of going to press, Tube Investments have eased to 61s. 3d. Ruston & Hornsby were good at 40s. 10½d., while Vickers have been active around 46s. 6d. John Brown eased to 44s. 3d., and Cammell Laird 5s. shares were 11s. 1½d.

Among shares of locomotive builders and engineers, the good yields and expectations that dividend rates will be maintained drew attention and brought in buyers and prices have been firm. Beyer, Peacock have strengthened further to 34s. 6d., Hurst Nelson were 42s. 6d. and North British Locomotive 14s. 1½d. Vulcan Foundry were sold around 22s. 6d., Birmingham Carriage were 34s. 1½d., Gloucester Wagon 10s. shares 12s., Wagon Repairs 5s. shares 12s. 9d. and Charles Roberts 5s. shares 20s. 4½d. Central Wagon changed hands at 60s.